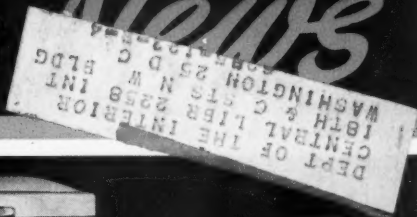


BUTANE-PROPANE

HEADQUARTERS FOR LP-GAS
INFORMATION SINCE 1931



SCAIFE makes a complete
line of cylinders to serve the LP-Gas
Industry ...and would like to have you
meet the family!



Scife Company

ment (Pittsburgh District), Pa.

JUNE, 1951—50c per Copy

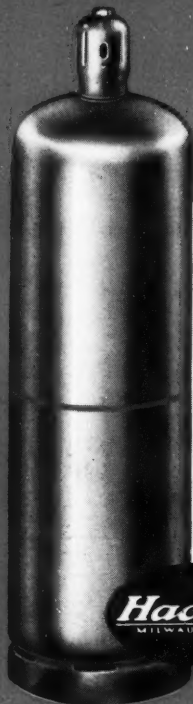
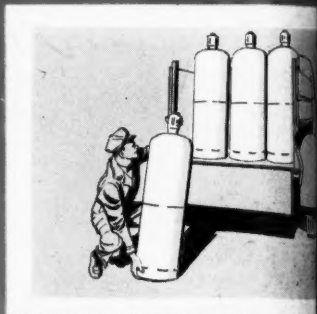


all-seeing eye
watches cylinder quality

HERE

to assure a better
Hackney Cylinder

THERE



The man bent over his microscope, above, is important to you and to all LP-Gas operators. He is part of the large staff of laboratory engineers which tests the quality of Hackney Lightweight Cylinders.

Steel and weld specimens from the cylinders are brought to this technician who examines and photographs them. Constant checks of this sort by trained personnel keep the quality of Hackney materials and workmanship at the high-

est possible level . . . assure the best cylinders for you.

Rigid inspections like this are only part of the care that goes into making Hackney Products. Skilled designers and the most modern manufacturing techniques as well, have made Hackney Lightweight Cylinders the preference of LP-Gas dealers and operators by more than 2 to 1.

For full information on Hackney LP-Gas Cylinders, write us.

Hackney
MILWAUKEE

PRESSED STEEL TANK COMPANY

Manufacturer of Hackney Products

1487 S. 66th St., Milwaukee 14 • 1399 Vanderbilt Concourse Bldg., New York 17 • 227 Haven Bldg., Cleveland 15 • 936 W. Peachtree St., N.W., Room 112, Atlanta 3 • 208 S. LaSalle St., Room 790, Chicago 4 • 352 Reservoir Bldg., Los Angeles 14

CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

Multiple Metering

THE ROCKWELL WAY



**ROCKWELL NO. 00
LP-GAS METER**

Save TIME, STEPS, MONEY

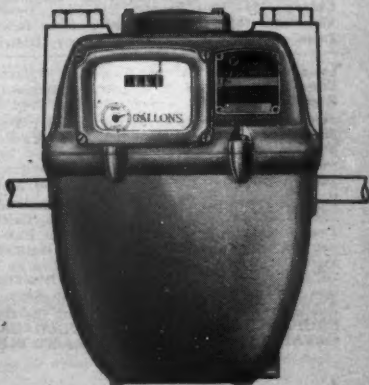
You can frequently conserve effort and materially reduce installation costs by serving a group of consumers from a single tank through Rockwell meters. By setting all the individual meters in a bank at or near the tank, you'll gain easy access for reading—save time, steps, money.

Rockwell No. 00 meters have strong weather-resistant outer cases. Their compact size saves space, permits manifolding in a small area. Eye appealing lines win customer acceptance and build confidence in your service. Write for bulletin 1163.



ROCKWELL MANUFACTURING COMPANY
PITTSBURGH 8, PA.

Atlanta Boston Chicago Columbus Houston Kansas City
Los Angeles New York Pittsburgh San Francisco Seattle Tulsa



Side or Top Connections—either $\frac{1}{2}$ " or $\frac{3}{4}$ "
female pipe thread. Meter dimensions 8" wide, 7 $\frac{1}{2}$ "
deep, 10 $\frac{1}{4}$ " high. Weight only 9 $\frac{1}{2}$ lb.

required, it is possible to make it by installing the 8000-ft. altitude pistons, which are available through the agencies and, in addition, planing about .080 in. off the head.

If the cylinder sleeves are worn more than .005 in. it would be a good idea to replace them when installing the high pistons. If you install the pistons and shave the head, we would suggest laying the head in position on the block without a gasket and turning the engine, over with the starter to make sure there will be no interference of parts.

Valve tappet clearances should be watched on this job to be sure that the exhausts do not ride on the tappets and burn. We would suggest that they be checked at 100 hours and again at 200 hours. This will give an indication of how frequently they should be checked thereafter.—Ed.

Gentlemen:

I would like to receive another copy of every issue that has the articles concerning "Servicing Thermostats in the Field," which began in your March issue.

These are the finest articles of their kind I have ever seen. I have misplaced all previous issues containing them and I am having all of my servicemen read them.

E. E. Fisher

Turon Electrical Supply
Turon, Kan.

Every serviceman would do well to carry these chapters in his truck to help solve field problems. The last of the series will be found in the July issue.—Ed.

Gentlemen:

We should like to know why it is necessary to use only silver solder on the copper connections for a gas line. Is there something about the gas which decomposes ordinary solder, or is there some other reason?

A Subscriber

California

NBFU Pamphlet 58 specifies silver solder because of its high melting temperature, which is 1900°. Other solders would melt at much lower temperatures, and, therefore, constitute a hazard in LP-Gas installations.—Ed.

Gentlemen:

Could you please advise me where we can get some information on the construction and application of a weed burner for attaching on a tractor for the burning of weeds in cotton fields.

I understand they are being used extensively in the East and some in California and as this is one of the largest areas for cotton farming around the valley perhaps we could get one going here for a demonstrator as well as a gas load builder.

T. E. K.

California

There are a number of these cotton weed burning machines in the San Joaquin valley, especially near Bakersfield. Practically the same equipment is now being manufactured by the M & R Farm Equipment Co., Greenville, Miss., and no doubt you can get full information regarding prices by writing them.—Ed.

Gentlemen:

Please send me information on using butane-propane fuels for city buses using 450 cubic inch Red Diamond International engines.

Also information as to converting the engine and manifold from gasoline to butane-propane and any information you might have as to the storage of the fuel at the garage.

W.H.P.

Tennessee

Butane-propane fuels may be used very satisfactorily in your 450-cu. in. Red Diamond International engines.

The conversion should be made under the supervision of a competent service engineer who is fully familiar with LP-Gas installation and operation. The carburetor manufacturers will either provide the man or recommend a qualified man in your vicinity.

High altitude pistons are available through the International agency. The 5000-foot pistons should do the job very nicely in your operation.

The exhaust heat should be removed from the intake manifold, either by inserting a piece of Swedish or stainless steel, or by changing to a special LP-Gas manifold. The latter is the

"full treatment," giving a little more power and generally showing some increase in economy.

The crankcase should be cleaned out at the time of the conversion, if necessary, by prolonged flushing with a detergent solvent. Thereafter the refills at the time of draining should be made with the SAE grade of oil recommended in the International service manual, but the make-up oil should be one grade lighter. On account of the clean operation on LP-Gas, drainage periods may be extended. We would suggest a drainage period of 5000 miles if you operate on a flat mileage basis, or as indicated by analysis of the used oil.

Storage of fuel at the garage should be in accordance with the National Board of Fire Underwriters Pamphlet No. 58 and any local ordinances. Your insurance agent can secure this information for you.

In case you store your buses in a closed garage, you should provide ample forced draft ventilation with the inlets near floor level, and duplicate controls by means of vapor-proof switches both inside and outside the garage. Our "Handbook Butane-Propane Gases" contains information on all phases of fuel storage and the ventilation of garages.—Ed.

Gentlemen:

We are interested in receiving any materials that you have on the industrial hazards encountered in working with butane gas.

We are particularly interested in allergies developed from working with the gas.

W.A.A.

Minnesota

Normally, there is little opportunity for personnel to come in contact with butane or propane gas since it is transported and stored in pressure-tight containers and when used, either in domestic, commercial, or industrial applications, it is transmitted through gas lines in the same manner as natural gas and manufactured gas.

When it is burned, the products of combustion are the same as from other fuels such as oil, coal, natural gas, and manufactured gas. The only hazard we see is the formation of carbon monoxide when the fuel is burned in unvented heaters which are improperly adjusted or where there is a deficiency of air in the room. This hazard exists with any fuel burned in an unvented heater.

Butane and propane do have anesthetic properties if inhaled in sufficient concentrations, but they are not toxic. We have no records or information as to allergies which might be developed. The U. S. Bureau of Mines has

published the following report on the effect of butane and propane on the human body: "Odor Intensity and Symptoms Produced by Commercial Propane, Butane, Pentane, Hexane, and Heptane Vapor. Report of Investigation 2979," by F. A. Patty and W. P. Yant.—Ed.

Gentlemen:

We would like to know if it would be possible to run a small spray gun from the vapor pressure of a delivery truck tank. We have two 700-gallon tanks mounted on our delivery truck, and we want to paint systems that belong to our customers as a good will feature.

B.F.

Oklahoma

It would be possible to run a small spray gun from the vapor pressure of a delivery truck tank, but such practice is dangerous and should not be considered. Using the vapors from the LP-Gas truck tank will release these flammable vapors into the atmosphere where they might drift to a source of ignition and cause an explosion or fire.

We suggest you use a small tank having a working pressure of 125 or 150 lbs. which can be charged with compressed air at a service station. The tank should be fitted with safety valve and suitable regulator to supply the spray gun.

There is also a small adapter available which can be installed under one of the spark plugs of the truck engine to fill a small tank with compressed air or inert gases. This unit can be purchased through truck equipment supply houses. It will develop up to 60 lbs. pressure.—Ed.

Gentlemen:

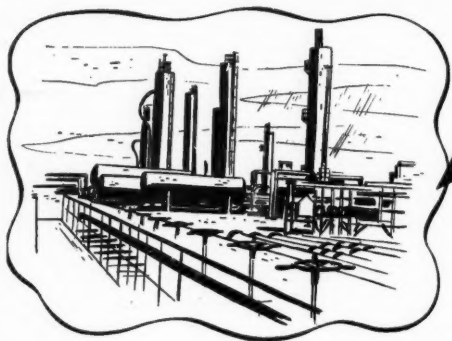
Where can I get outage charts for LP-Gas tank cars?

J.W.T.

North Dakota

There are outage charts published for all LP-Gas tank cars which show the outage in gallons in accordance with the inches outage. The outage charts vary for different series of cars and therefore care should be exercised in their use.

Your fuel supplier should be able to obtain and furnish you these charts for the cars in which he supplies your fuel.—Ed.



LP-Gas has gone
to work on farms ...
furnishing power for
tractors ...



Distributors
can keep
abreast of
this new demand
by asking for ...



STANOLIND
Oil and Gas Company



LP-GAS SALES SECTION • P. O. BOX 591 • TULSA, OKLAHOMA

Comment

GROWING emphasis on the importance of tractor conversions and high interest in the actual strides the industry has made in this direction has brought an extremely pertinent question to light in recent weeks. Continued repetition of that question, "How many LP-Gas conversions have been made on tractors to date?" has brought action.

BUTANE-PROPANE *News* has just completed a significant national survey on that question, the results of which may be found in this issue, and which provides the industry with its own, accurate statistics on the current conversion picture.

The survey indicates that while the total number of LP-Gas tractors in the U.S. is only about 90,000, the attainable potential is enormous. Comparisons, sales campaigns and estimates of this potential load may now be projected on the basis of these figures.

•

We knew it was loaded all the time!

That is, we knew that the industrial load available to small town dealers throughout the country was big—but when BUTANE-PROPANE *News* ended its task of compiling subject matter on the cream of light industrial applications for this special farm and industrial issue, even we were a little surprised at the tremendous potential which had been revealed.

And in that job of research we found a story. A story of industries which have a real need of and preference for the services offered exclusively by LP-Gas. So numerous were these applications that it was necessary to condense many into brief paragraphs in a special section.

Our conclusion? The small industrial market represents large volume sales with year around dependability and predictability for the dealer.

We believe you will agree that such assets warrant thought, action and selling.

•

C. C. Turner's series of articles on "The Practical Management of an LP-Gas Business" has created unusual interest in the industry.

Many requests for back numbers have been received from plant operators who missed one of the first installments. The series started in the April, 1951, issue of BUTANE-PROPANE *News*.

These back numbers will be mailed promptly upon receipt of the regular single copy price of 50c each, while the supply lasts. Your request should be addressed to Reader's Service Dept., B-P News, 198 So. Alvarado Street, Los Angeles 4, Calif.

The third installment of Mr. Turner's series appears in this issue.

By Ed.



Keep Your Eye on Beacon

**for better, faster year 'round
Butane-Propane Service**



You can depend on Beacon to handle all of your LPG
problems . . . with speed and efficiency. Call 55553 Tulsa.

BEACON

PETROLEUM COMPANY

P. O. BOX 2618 . .
TULSA, OKLAHOMA

P. O. BOX 2478
HOUSTON, TEXAS

53 West Jackson Blvd.
CHICAGO 4, ILLINOIS



BEYOND THE MAINS

PART 4 OF THERMOSTAT SERIES NEXT MONTH

Because this issue of BUTANE-PROPANE News is devoted largely to farm and industrial applications of liquefied petroleum gas, no room is available to publish the fourth and last installment of the series of articles entitled "Servicing Thermostats in the Field," by M. B. Gault, which has been appearing in recent issues.

Part 4 will appear in July.

Conflicting dates of association meetings in many sections of the country this year have caused inconvenience and embarrassment to individuals who, normally, would attend.

For instance, the AGA Natural Gas Dept. spring meeting was held in Dallas on May 7-8, with the LPGA Chicago meeting occurring May 7-10, making it impossible for those who wanted to appear at both meetings to spend more than part of their time at either one and then only by flying from one to the other. This is the third successive year this has occurred.

It is interesting to record that for more than 20 years the date of the AGA natural gas spring meeting has been influenced by the running of the Kentucky Derby. The AGA meeting is always the first Monday after the Derby and the Derby is always held on the first Saturday of May. This is a precedent that the organization would like to continue.

In June there are three state or district meetings which occur either on the same or successive days. Because their locations are hundreds of miles apart, gasmen cannot possibly attend them all.

Maybe next year effort will be made to space out all conventions for the good of those who like to attend these affairs.

For the good of the industry, associations should consult with one another before naming their convention dates.

Liquefied petroleum gas workers—apparently those handling it from the refinery to the consumer—were included in the revised "List of Essential Activities" just issued by Secretary of Commerce Charles Sawyer for the guidance of the Department of Defense in scheduling calls on reservists to active duty, and for the information of Selective Service in determining draft deferments.

But Secretary of Labor Maurice J.

Tobins, who a short while afterwards issued his new list of critical occupations for use of the Department of Defense in considering requests for delay in calls to active duty of reservists and members of the National Guard, overlooked liquefied petroleum workers.

A separate construction order fitted to the needs of the petroleum and gas industries and related fuels will be issued sometime soon (perhaps it has been issued by the time this is in print), according to an agreement reached between the NPA and the PAD, it has been announced.

The PAD has taken some exception to the provisions of the new NPA building limitations order issued last in April, and NPA officials had agreed to allow PAD to write its own ticket, in effect, for the petroleum industry in all its ramifications. The PAD also will administer the new building order for the petroleum industry, when it is promulgated, under the agreement.

A major factor contributing in no small measure to the rapid growth of the LP-Gas industry is the creation of mass markets when city populations shift to suburbs and rural areas. It is another instance of human nature at work for us—a simple case of people refusing to accept lower standards of living with competitive fuels when they move beyond the mains.

Mark Anton, president of Suburban Propane Gas Corp. in New Jersey, illustrated this point before the Providence Society of Financial Analysts recently, at a meeting held in Providence, R. I.

He pointed out that the suburbs of 168 metropolitan standard cities in

the United States have grown 34% in the last decade, as compared to a national growth average of only 14.5%. He emphasized the resultant growth in this field by revealing that his company's sales have more than reflected the gain in suburban population.

Our invasion of the power field may not be complete, but manufacturers are turning out a much larger proportion of butane and propane-fueled buses, trucks and tractors than they did just two years ago. LP-Gas is occupying a more important position in this field these days and eventually it probably will become the preferred fuel for commercial vehicles.

The reason for the radical change in the picture is relatively simple. Manufacturers now realize that their product, with LP-Gas carburetion installed as original equipment, will mechanically outlast liquid-fueled models by a considerable margin. Transit companies are demonstrating the savings in maintenance and (in some areas) in fuel costs.

One such manufacturer, the Fageol Twin Coach Co., has disclosed that 459 of their propane buses are in service today on transit properties in leading cities. There are 251 more LP-Gas models on order and scheduled for early delivery. In addition, 490 kits have been sold to convert postwar "Twins" to the more efficient fuel.

This testimonial by one of the largest producers of heavy-duty high-speed buses should be enough to convince the most skeptical power prospect of the well-deserved esteem in which LP-Gas is held by the "men who know"—the manufacturer and the transit company.

BUTANE-PROPANE
News

FARM, INDUSTRIAL AND POWER ISSUE

Tractor Surveys



Dehydration



Cotton



Poultry



Tobacco



Irrigation



Industrial Applications



Farm Applications



Conversions



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BUTANE-PROPANE
News

FARM, INDUSTRIAL AND POWER ISSUE

Tractor Surveys



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Farm Applications



Conversions



BUTANE-PROPANE NEWS'

TRACTOR SURVEY

Bulk Plants Across the Nation Cooperate to Record the Story of Power on the Farm

THE hottest subject today in liquefied petroleum gas circles is "carburetion"—in particular, the conversion of gasoline engines in tractors to butane or propane.

The report of 100,000 tractor conversions in 1950 excited the imaginations of LP-Gas dealers and pointed up the huge and profitable market that exists over broad areas to build a greatly needed summer fuel load and which would help to balance winter demand, giving a possible, ideal 1:1 ratio.

While the 100,000 estimate was apparently too high, the conversions did apparently total more than three-quarters that number. Realizing the importance to dealers of this expanding, attractive source of fuel and equipment sales, BUTANE-PROPANE News decided to make a national survey to determine just what has taken place and its significance to dealers.

A postcard questionnaire was mailed out to approximately 3100 bulk plants across the country which asked distributors to:

1. Estimate the number of tractors in their sales areas, and
2. Indicate the percentage of such total tractors which have been converted to LP-Gas.

From the exceptionally high return of 20%, it is now possible to estimate from this survey the number of LP-Gas-burning tractors now in use, and thus to determine a very accurate picture of just what has been accomplished in the number of conversions in each state and the percentage of the whole that this represents. Table 1 gives these details, totals indicating that there are now 87,320 tractors in the U.S. using LP-Gas for fuel.

The potential is enormous. There are approximately 4,000,000 tractors at work in this country at the present time. Figures compiled for Kansas last year, as an example, showed that if but 16.3% of the tractors in the state were converted to LP-Gas, the resulting fuel consumption would equal the entire domestic volume.

The accompanying map shows the bulk of sales made to have been in the Kansas and adjacent areas. This is largely due to a con-

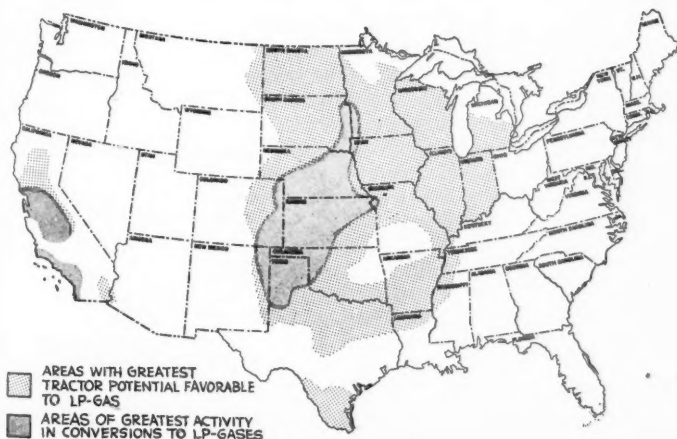
centration of sales effort there. Areas of smaller farms or districts with physical disadvantages to power farming do not have this same potential but there is a considerable market in every state and dealers who alert themselves to this fact will reap substantial award.

Most revealing are comments made by some who returned questionnaires, some of which appear below. These give intimate explanations of local conditions that have influenced conversion sales, or lack of them.

There are problems to be solved by dealers and prospective users, alike, before LP-Gas for tractor use can be made general—such as supply in local areas, price structures as influenced by transportation costs and competitive fuels, and engineering details—but on the whole the newly popular tractor field is a bright use to contemplate.

Other surveys of industry trends will be made from time to time and reported here to acquaint dealers with sales opportunities and nation-wide movements. We ask the cooperation of the industry in obtaining such information and wish to thank those who contributed to the results of the tractor survey.

Tractor Survey Map



STATE-BY-STATE / BREAKDOWN

TABLE 1. COMPILED FROM BUTANE-PROPANE NEWS TRACTOR SURVEY

STATE	% Converted to LP-Gas	Tractors op- erating on LP-Gas
Alabama	2.4 %	830
Arizona	7.9 %	750
Arkansas	2.2 %	1,190
California	4.6 %	5,100
Colorado	1.8 %	860
Connecticut		....
Delaware		....
Florida	.6 %	140
Georgia	1.8 %	940
Idaho	.5 %	180
Illinois	2.3 %	5,350
Indiana	.9 %	1,310
Iowa	.6 %	1,480
Kansas	9.4 %	14,390
Kentucky	.4 %	180
Louisiana	9.2 %	2,850
Maine		....
Maryland		....
Massachusetts		....
Michigan	1.1 %	1,820
Minnesota	2.0 %	4,270
Mississippi	7.2 %	2,910
Missouri	2.1 %	2,600
Montana	1.3 %	560
Nebraska	4.6 %	5,840
Nevada	2.5 %	100
New Hampshire		....
New Jersey		....
New Mexico	7.5 %	1,460
New York		....
North Carolina	.1 %	60
North Dakota	4.6 %	4,920
Ohio	*	....
Oklahoma	5.7 %	5,820
Oregon	.6 %	280
Pennsylvania	.1 %	140
Rhode Island		....
South Carolina	*	....
South Dakota	2.1 %	1,970
Tennessee	.7 %	330
Texas	8.0 %	18,190
Utah	1.0 %	140
Vermont		....
Virginia	*	....
Washington	.2 %	100
West Virginia		....
Wisconsin	.1 %	180
Wyoming	.5 %	80
TOTALS		87,320

* Less than .1 %

STATE-BY-STATE COMMENT

Alabama

Mobile—Believe use of LP-Gas for carburetion due for big increase.

Gadsden—Farms too small here for practical conversions.

Arkansas

Dermott—Field just opening here. Handicapped by being unable to get carburetors.

Delight—Working on idea of consolidating storage for two or three farmers on one-tractor farms.

California

Fresno—Have been installing carburetors here for 20 years.

Fort Bragg—Tractors used mostly for logging operations. So far, no LP-Gas used.

Colorado

Fort Morgan—Have sold 49 M&M butane tractors; made 30 conversions in past two years.

Pueblo—Have prospects of 8% saturation by fall.

Delaware

Middletown—Propane must be sold by the dealer for about 15c per gallon, plus 6½c tax in this area; so there is no saving.

Florida

San Antonio—Working with number of large tractor users; and believe we'll have about 100 on propane by the end of year.

Fort Myers—Much interest. Expect increased conversions soon.

Georgia

Louisville—Have just begun to convert a few tractors.

Savannah—Single tractor farming discourages customer investment.

Idaho

Boise—No more than 30 operating on propane in this vicinity.

Illinois

Rockford—Lack of facilities and experience in converting is retarding factor.

Lawrenceville—Just beginning to come into use. Considerable interest.

Indiana

Bicknell—Farmers are just asking questions so far.

Indianapolis—Considerable interest; too new to evaluate.

Iowa

Osage—Need more educational helps to push. Particularly price comparisons, service problems, etc.

Clarinda—Thousands of tractors, but very few on LP-Gas. We don't urge it.

Kansas

Hutchinson—Every owner is an enthusiastic booster.

Grinnell—Changeovers made every day.

Great Bend—Big field of prospects. Increasing in popularity and acceptance.

Kentucky

Nicholasville—Practically no tractors using LP-Gas in the 6 counties we serve.

Elizabethtown—We have just started converting farm tractors.

Louisiana

Coushatta—Demand still good for this service.

Ferriday—All customers satisfied. Prospects good.

Maine

Fairfield—Propane as a fuel has not hit this state as yet.

Maryland

Taneytown—None using LP-Gas in the area that we know of.

MASSACHUSETTS

Lowell—Tax problem in Massachusetts.

MICHIGAN

Flint—About 12 factory-equipped M & M tractors in use here.

Kalamazoo—Tractor fuel very new in this area.

MINNESOTA

Ortonville—Just really started this past year, but now snowballing. We were very careful with every installation and now have the darndest bunch of farmer salesmen one could hope for.

Mora—Just starting in this work. Need listings of equipment and service information.

MISSISSIPPI

Prairie—Number of small farms and small tractors is limiting factor.

Batesville—Interest and demand will soon force us to devote more time to this.

MISSOURI

Kennett—Began 2 years ago but not too much luck. Have changed equipment and plan for greater gains this year.

Springfield—No activity in Ozarks on small tractors; perhaps later.

MONTANA

Glendive—Not enough price difference in gasoline and propane to induce conversions.

Hamilton—Marked interest. We are starting to convert some within the next month.

NEBRASKA

Wauneta—Making conversions at the rate of about 1 a day. Factory equipped tractors are selling as fast as received.

Brule—Diesel is strong, but propane has best future.

NEW MEXICO

Clovis—Anticipate an equipment shortage. Install about 10 per week.

Lordsburg—More and more popular. Shortage of materials and skilled installers is limiting factor.

NEW YORK

Liberty—We are not interested in the development of this class of business for the Eastern market.

Poughkeepsie—Still pioneering the use of propane as a motor fuel in this area.

NORTH CAROLINA

Albemarle—Freight rates so high that in order to compete with other fuels our percent of mark-up would be so low as to not be worth while. Also, we feel that it would have an overall effect on propane prices that would be detrimental to business as a whole.

Edenton—Converting 11 now; also changing over 3 sawmill engines to propane.

NORTH DAKOTA

Williston—If conversions are available, the rate will probably increase at least 10% by fall.

OHIO

Dover—Setting tank and equipment this month for first experimental propane tractor in area.

Lebanon—Starting conversions this month. One demonstrator ready.

OKLAHOMA

Geary—Propane carburetion catching on fast this year.

Blackwell—Outlook for more conversions is very favorable.

OREGON

Klamath Falls—Case and Moline have just recently stocked propane-equipped tractors in agencies here. Two units in operation.

Salem—Now actively promoting. Expect to eventually cover most of the tractors.

PENNSYLVANIA

Harrisburg—Much interest, but dealers have not come up with facts and figures interesting to farmers. High freight rate, and Pennsylvania laws and regulations re use of LP-Gas have not helped to develop use as motor fuel.

Lewisburg—Have had numerous inquiries.

SOUTH CAROLINA

Loris—Held first tractor conversion demonstration in this area April 14, 1951.

Greenville—Finding it difficult to get early deliveries of conversion equipment.

SOUTH DAKOTA

Gettysburg—Have factory-equipped out this spring.

Britton—Conversions slow; cost is largely the reason.

TENNESSEE

Jackson—Expect a big increase by next year.

Murfreesboro—Out of 14 in territory, 3 are factory-equipped M&M's.

TEXAS

Spur—Potential is about 85% of total tractors. **Leonard**—Aiming at 50% in the next year—now have 30 units to put on as we get to them.

Perryton—Program slowed down by shortage of tanks and systems.

Mexia—We need more good sales dope on carburetion.

Lamesa—The number is increasing at a rapid rate.

UTAH

Tremonton—State tax on LP-Gases repealed. Numerous inquiries about changeovers.

Cedar City—Sold 36 jobs in two days.

VERMONT

Burlington—No tractors, buses, or trucks operating on this type fuel that we know of.

Brattleboro—Use of propane for tractors should be brought before the farmers; i.e., grange meetings, agriculture shows, etc.

WASHINGTON

Wenatchee—Due to high costs of shipping propane here, we can't compete with diesel.

Tacoma—No one in this area has done anything on carburetion.

VIRGINIA

Pulaski—Have avoided load because of various tax-collecting complications.

Wytheville—Virgin territory for LP-Gas as motor fuel—we have a couple of road-rollers, 2 sawmills, and our own trucks and passenger cars using LP-Gas.

WISCONSIN

Appleton—Just getting started in this area... have 2 factory-equipped and 10 conversions.

Burlington—First tractor was put on propane in November, 1950. Requests for propane fuel are growing rapidly.

WYOMING

Gillette—Great deal of interest this spring; but now being used on only 1 ranch (3 tractors).

Potential Effect of Tractor Conversions to LP-Gas

By W. R. Thorne

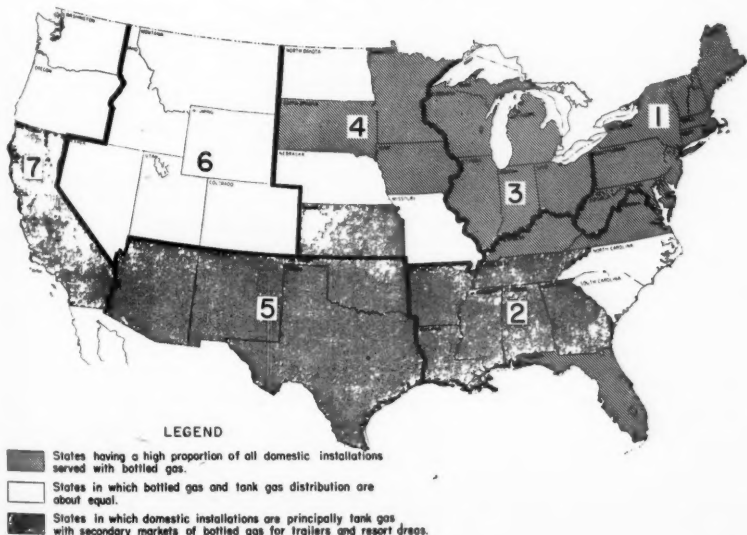
Stanolind Oil and Gas Co., Tulsa, Oklahoma

THE year 1949 saw a revival of interest in the use of butane, propane, and mixtures of the two, for fuel in internal combustion engines. Many LP-Gas concerns were working diligently in 1950 toward a goal of expanding and balancing sales through this medium. Others

are considering the possibilities for the summer season of 1951.

Many in the industry envision additional income from the use of LP-Gas as tractor fuel. This use also offers an excellent opportunity to equalize the winter-summer ratio of sales, which has fallen fur-

FIG. 1. METHODS OF DISTRIBUTION OF LP-GAS IN BOTTLES AND TANKS.



ther out of balance with the expanded use of LP-Gas for space heating.

As service becomes available in more widespread rural areas, the potential use of LP-Gas for internal combustion engines in farm tractors offers great possibilities for increasing sales. Each individual area within the country presents a problem of its own.



W. R. THORNE

FIG. 2. GASOLINE COSTS IN ϵ /GAL.*

	(Ex. Tax) Dealers Net Price	Indicated Dealer Margin	Indicated Cost to Farmer
Maine	15.00	5.00	20.0
New Hampshire	15.60	4.80	20.4
Vermont	15.60	5.20	20.8
Massachusetts	14.90	5.30	20.2
Connecticut	15.10	5.00	20.1
Rhode Island	14.90	5.10	20.0
New York	15.10	6.30	21.4
Pennsylvania	14.70	4.70	19.4
New Jersey	14.60	5.80	20.4
Delaware	14.70	5.70	20.4
Maryland	14.50	5.10	19.6
West Virginia	16.10	7.10	23.2
Virginia	14.10	6.10	20.2
Kentucky	16.50	4.30	20.8
Tennessee	15.00	6.00	21.0
North Carolina	15.60	5.70	21.3
South Carolina	14.60	5.90	20.5
Georgia	15.90	5.60	21.5
Florida	15.20	5.30	20.5
Alabama	15.70	5.60	21.3
Mississippi	15.20	6.70	21.9
Arkansas	15.90	5.60	21.5
Louisiana	15.30	5.70	21.0
Ohio	15.50	4.30	19.8
Indiana	16.50	5.00	21.5
Illinois	15.50	4.96	20.46
Michigan	15.90	5.01	20.91
Wisconsin	16.10	5.30	21.40
Missouri	15.20	4.20	19.4
Kansas	14.00	4.40	18.4
Nebraska	15.50	4.00	19.5
Iowa	15.40	4.80	20.2
South Dakota	16.70	5.00	21.7
North Dakota	16.80	4.70	21.5
Minnesota	16.00	5.40	21.4
Oklahoma	15.50	5.50	21.0
Texas	14.00	5.00	19.0
New Mexico	16.30	5.50	21.8
Arizona	17.30	3.30	20.6
Colorado	14.80	5.20	20.0
Utah	16.40	3.10	19.5
Nevada	17.00	5.00	22.0
Idaho	16.30	4.50	20.8
Wyoming	15.60	6.90	22.5
Montana	16.00	4.50	20.5
California	14.50	4.80	19.3
Oregon	15.00	5.50	20.5
Washington	17.80	5.00	22.8

* From National Petroleum News, Feb. 7, 1951. Based on selected cities.

Just what can the use of LP-Gas as tractor fuel mean to the young and growing LP-Gas industry?

This paper attempts to determine the potential effect on the present market of tractor conversion to LP-Gas for fuel. Figure 1 indicates a breakdown of the United States into seven major marketing areas:

1. New England
2. Southeast
3. Lake States
4. Plains States
5. Southwest
6. Rocky Mountains
7. Pacific Coast

Figure 1 also indicates the three most common methods of distribution of LP-Gas by states. For comparison purposes, in areas utilizing principally tank gas service, a dealer margin of 5c per gallon is assumed for development of the tractor market. In areas where bottled gas and tank gas distribution are approximately equal, a 6c per gallon margin is assumed. Where the majority of domestic installations are served with bottled gas, 7c is assumed.

Gasoline cost data shown in Fig-

FIG. 3. POTENTIAL EFFECT OF TRACTOR CONVERSION TO LP-GAS FOR FUEL ON LP-GAS SALES*

States By Area	Freight Base Points	Estimated LP-Gas Cost \$/Gal.	Approx. Tractor Fuel Cost \$/Gal.	Estimated Dealer's Margin \$/Gal.	Indicated LP-Gas Cost to Farmer \$/Gal.	1/ Gasoline Cost to Farmer \$/Gal.	2/ Indicated Incremental Savings of LP-Gas Over Gasoline \$/Gal.	3/ Number of Tractors	4/ Gals. Per Tractor Per Year	5/ LP-Gas Potential Sales/Year (000 Gallons)		
Maine	Research, N. J.	7	2.5	7	16.5	20.0	3.5	26,368	644	-		
	New Hampshire	"	7	2.5	7	16.5	20.1	3.6	11,176	644	-	
	Vermont	"	7	2.5	7	16.5	20.8	4.3	14,809	644	9,500	
	Massachusetts	"	7	2.0	7	16.0	20.7	4.7	25,300	644	16,500	
	Connecticut	"	7	2.0	7	16.0	20.1	4.1	17,067	644	11,000	
	Rhode Island	"	7	2.0	7	16.0	20.0	4.0	1,700	644	1,400	
	New York	"	7	2.5	7	16.5	21.4	4.9	327,748	778	105,300	
	Pennsylvania	"	7	2.5	7	16.5	19.4	2.9	344,517	811	-	
	New Jersey	"	7	2.0	7	16.0	20.1	4.1	11,692	89	27,100	
	Delaware	"	7	2.0	7	16.0	20.4	4.4	7,669	85	7,700	
Maryland	"	7	2.0	7	16.0	19.4	3.4	23,049	840	8,500		
West Virginia	"	7	2.5	7	16.5	21.2	4.7	12,485	545	10,000		
							(6.42)	\$70,792		\$28,700		
Virginia	Kilgore, Texas	4	4.80	7	15.8	20.7	4.9	44,735	890	36,900		
	Kentucky	"	4	3.78	7	14.78	20.8	6.0	44,735	795	35,400	
	Tennessee	"	4	3.38	5	12.38	21.0	8.72	66,901	790	37,100	
	North Carolina	Shreveport, La.	4	4.54	6	14.54	21.1	6.57	43,739	875	52,000	
	South Carolina	"	4	4.18	6	14.18	20.5	6.32	31,120	890	27,900	
	Georgia	"	4	3.57	5	12.57	21.5	8.93	59,323	887	146,100	
	Florida	"	4	4.17	5	15.17	20.5	5.33	31,770	778	30,000	
	Alabama	"	4	3.34	5	12.05	21.3	9.25	44,700	890	30,900	
	Mississippi	"	4	3.57	5	13.57	22.5	89.53	10,467	903	36,500	
	Arkansas	"	4	3.54	5	13.54	21.5	9.99	26,113	912	49,400	
Louisiana	Local	4	3.00	5	11.00	19.0	8.00	20,078	1,750	100,700		
							(7.78)	\$67,766		\$28,700		
Ohio	Group 3	4	4.24	7	15.24	19.4	3.95	129,489	770	-		
	Indiana	"	4	3.90	7	13.90	21.5	7.60	145,796	870	126,600	
	Illinois	"	4	3.82	7	13.82	20.46	6.64	237,460	140	289,700	
	Michigan	"	4	3.03	7	13.03	20.71	7.69	145,949	770	127,600	
	Wisconsin	"	4	3.03	7	14.03	21.4	7.39	120,948	770	119,200	
								(7.71)	\$11,762		\$68,600	
	Missouri	Group 3	4	3.35	6	12.35	19.4	7.05	128,061	975	171,000	
		Kansas	Local	4	2.0	5	10.45	19.4	7.75	157,162	1,475	275,900
		Nebraska	Group 3	4	3.35	6	12.35	19.5	7.15	128,989	1,045	117,600
		Iowa	"	4	2.10	7	13.10	20.7	6.80	246,139	1,030	198,600
North Dakota		"	4	4.67	7	15.67	21.7	7.03	73,251	1,070	110,400	
South Dakota		"	4	4.67	7	15.67	21.5	6.03	168,981	1,410	150,500	
Minnesota		"	4	3.87	7	13.87	21.4	7.53	211,578	1,100	234,000	
								(7.08)	\$70,982		\$1,745,000	
Oklahoma		Local	4	2.0	5	11.0	19.0	8.00	107,000	1,292	117,600	
		Texas	"	4	1.0	5	11.0	19.0	8.00	277,135	1,287	268,600
	New Mexico	W. Texas	4	2.7	5	13.7	21.5	7.80	19,430	1,040	20,400	
	Arizona	L.A. California	6	3.33	5	14.33	20.6	6.37	9,432	1,200	23,300	
								(6.34)	\$9,127		\$27,700	
	Colorado	Berger, Texas	4	3.01	6	13.01	20.0	6.19	17,805	1,775	61,000	
		Utah	Salt Lake City	4.5	2.30	6	14.00	19.5	5.5	13,721	244	3,600
		Nevada	L. A. California	6	5.70	6	17.70	22.0	4.22	3,917	828	3,100
		Idaho	"	5	2.09	6	14.09	21.3	3.23	35,620	710	-
		Wyoming	Local	5	2.5	6	13.5	22.5	9.0	16,162	89	13,900
Montana		Casper, Wyoming	5	2.44	6	13.44	20.0	6.56	13,112	1,110	25,000	
								(6.78)	\$10,297		\$28,700	
California		Local	6	2.5	5	13.5	19.3	5.8	120,979	817	92,900	
		Oregon	L. A. California	6	6.05	6	18.05	20.5	3.45	44,006	778	-
		Washington	"	6	8.16	6	20.16	22.8	2.64	10,010	676	-
								(5.27)	\$97,026		\$7,300	

U.S.A.

(7.33)

3,643,475

1,244,900

1/ Cost of gasoline to farmer taken from Nat. Pet. News, Feb. 7, 1951 p. 52 as dealers' net price

2/ U. S. Dept. of Agriculture 1950 PM 72.

2/ Based on States where incremental savings of LP-Gas over gasoline is 16/gal. or more.

3/ Estimated Transport Rates, Local Area.

3/ Tractor and Tractor Magazine, July 8, 1950. (Excludes Garden Tractors)

* If 50.2% of All Tractors Were Converted, It Would Equal Present Domestic Consumption.

ure. 2 were taken from *National Petroleum News*.

Figure 3 summarizes the data used in arriving at the potential of LP-Gas as a tractor fuel. The potential was developed by assum-

ing a normal freight base point for each state. Prices were estimated for the f.o.b. points for individual states. The f.o.b. plant price, plus freight, plus dealer's margin, gives an indicated LP-Gas

FIG. 4. POTENTIAL EFFECT ON REVENUE OF TRACTOR CONVERSIONS TO LP-GAS.

	LP-Gas Potential Gals./Year (000 Omitted)	Indicated LP-Gas Cost to Farmer ¢/Gal.	Gross Revenue \$/Year	Incremental Savings of LP- Gas over Gaso- line. ¢/Gal.	Saving in Tractor Fuel Cost to Farmer \$/Year
Maine	-	-	-	-	-
New Hampshire	-	-	-	-	-
Vermont	9,500	16.5	1,567,500	4.3	408,500
Massachusetts	16,600	16.0	2,656,000	4.2	697,200
Connecticut	11,000	16.0	1,760,000	4.1	451,000
Rhode Island	2,400	16.0	384,000	4.0	96,000
New York	105,300	16.5	17,374,500	4.9	5,159,700
Pennsylvania	-	-	-	-	-
New Jersey	27,100	16.0	4,336,000	4.4	1,192,400
Delaware	27,200	16.0	4,352,000	4.4	1,196,800
Maryland	6,500	16.0	1,040,000	3.6	234,000
West Virginia	28,400	16.0	4,544,000	6.7	1,902,800
	<u>234,000</u>	<u>(16.2)</u>	<u>\$38,014,000</u>	<u>(4.6)</u>	<u>\$11,338,400</u>
Virginia	36,900	15.8	5,830,200	4.4	1,623,600
Kentucky	35,600	14.78	5,261,700	5.02	1,787,100
Tennessee	37,100	12.38	4,593,000	8.72	3,235,100
North Carolina	52,700	14.51	7,646,800	6.79	3,578,300
South Carolina	27,900	14.18	3,956,200	6.32	1,763,300
Georgia	46,100	12.57	5,794,800	8.93	4,116,700
Florida	18,000	15.17	2,730,600	5.33	959,400
Alabama	30,900	12.05	3,723,500	9.25	2,858,300
Mississippi	36,500	11.37	4,150,000	10.53	3,843,500
Arkansas	49,400	11.51	5,685,900	9.99	4,955,100
Louisiana	38,700	11.00	4,257,000	8.00	3,096,000
	<u>409,800</u>	<u>(13.09)</u>	<u>\$53,629,700</u>	<u>(7.76)</u>	<u>\$31,796,400</u>
Ohio	-	-	-	-	-
Indiana	126,800	13.96	17,701,300	7.54	9,560,700
Illinois	269,700	13.82	37,272,500	6.64	17,908,100
Michigan	127,800	13.02	16,639,600	7.89	10,083,400
Wisconsin	139,300	14.01	19,515,900	7.39	10,294,300
	<u>663,600</u>	<u>(13.73)</u>	<u>\$91,129,300</u>	<u>(7.21)</u>	<u>\$47,846,500</u>
Missouri	121,000	12.35	14,943,500	7.05	8,530,500
Kansas	225,900	10.65	24,058,400	7.75	17,507,300
Nebraska	137,800	12.35	17,018,300	7.15	9,852,700
Iowa	258,600	13.40	34,652,400	6.80	17,584,800
South Dakota	119,400	15.47	18,471,200	6.23	7,438,600
North Dakota	150,800	15.47	23,328,800	6.03	9,093,200
Minnesota	234,900	13.87	32,580,600	7.53	17,688,000
	<u>1,248,400</u>	<u>(13.22)</u>	<u>\$165,053,200</u>	<u>(7.02)</u>	<u>\$87,695,100</u>
Oklahoma	137,800	11.0	15,158,000	9.00	12,402,000
Texas	288,000	11.0	31,680,000	8.00	23,040,000
New Mexico	20,600	11.7	2,410,200	9.80	2,018,800
Arizona	11,200	14.43	1,630,600	6.17	697,200
	<u>457,700</u>	<u>(11.12)</u>	<u>\$50,878,800</u>	<u>(8.34)</u>	<u>\$38,158,000</u>
Colorado	61,000	13.81	8,424,100	6.19	3,775,900
Utah	3,600	14.00	504,000	5.50	198,000
Nevada	3,200	17.78	377,000	4.22	135,000
Idaho	-	-	-	-	-
Wyoming	13,900	13.5	1,876,500	9.0	1,251,000
Montana	56,800	13.44	7,633,200	6.56	3,726,100
	<u>138,500</u>	<u>(13.59)</u>	<u>\$18,815,500</u>	<u>(6.56)</u>	<u>\$9,085,900</u>
California	92,900	13.5	12,541,500	5.8	5,388,200
Oregon	-	-	-	-	-
Washington	-	-	-	-	-
	<u>92,900</u>	<u>(13.5)</u>	<u>\$12,541,500</u>	<u>(5.8)</u>	<u>\$5,388,200</u>
Total U. S.	3,244,900	(13.25)	\$430,062,000	(7.13)	\$231,308,500

cost to the farmer. The indicated incremental savings by use of LP-Gas over gasoline were determined by taking the difference between the cost of gasoline and the cost of LP-Gas.

Considering only those states where a saving of 4c per gallon, or more, can be realized by the farmer through use of LP-Gas instead of gasoline, a potential annual consumption for tractor fuel of 3,244,900,000 gallons is indicated. This potential exceeds by more than 400 million gallons the total LP-Gas consumption for all uses in 1949, which was 2,836,599,000. The average indicated difference in price of gasoline and LP-Gas is 7.13c per gallon.

It is interesting to note that, considering the country as a whole, if 50.2% of the tractors were converted to LP-Gas the present domestic consumption would be doubled. Thus, the potential market is almost twice the present domestic consumption. (The 1949 domestic consumption was 1,627,550,000.)

Figure IV, showing the potential effect on revenue through tractor conversion to LP-Gas for fuel, indicates that the LP-Gas dealers in the country can look to a potential increase of approximately \$430,000,000 per year. The indicated savings in tractor fuel cost which can be offered to the farmer amounts to more than \$230,000,000 per year, and averages 7.13c per gallon for those areas which have a savings of 4c per gallon or more over gasoline cost.

The potential in the tractor fuel

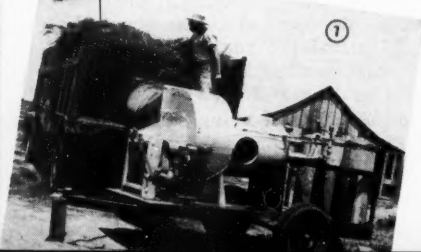
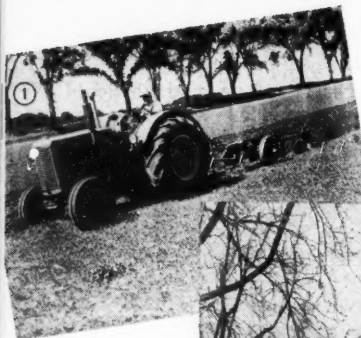
market is apparently one which challenges all of us, and no doubt will be developed at increasing rates over the next few years.

The tractor fuel market represents only one segment of the internal combustion engine field. Intra-city trucks, urban buses, taxi fleets enhance this potential.

Will Influence Expansion

It is apparent that a closer look at each individual area by the LP-Gas distributor can mean increased business and a more balanced annual income over the years to come. In addition, a more balanced seasonal demand will encourage producers to expedite present expansion plans and provide a greater supply of LP-Gas. It is estimated that, over the entire country, approximately 70% more LP-Gas is consumed in the domestic market during the six winter months in a normal year than during the summer months. This situation creates problems in production, transportation, storage, and supply.

The winter of 1950-51 has brought these problems close to home for everyone connected with the LP-Gas industry. It may be 70 degrees today, while we are reviewing the tractor potential, but a reminiscent thought back to this past winter season will drive home the fact that something must be done. As well as being economically attractive for all concerned, internal combustion engine use of LP-Gas is a step in the right direction toward solving some of the industry's major problems.



FARM APPLICATIONS

Case tractor with Santa Fe fuel tank on a plowing job.

Farmall tractor at field, gravity refueling station.

Hardie pressure sprayer in deciduous orchard.

Two "Algas" converted engines power this beet loading machine.

Hog water fountain heater for winter. Johnson Gas Appliance Co.

"Roto-Beater" disintegrating corn stalks to be plowed under.

Farm-Mor equipment dehydrating alfalfa.

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2

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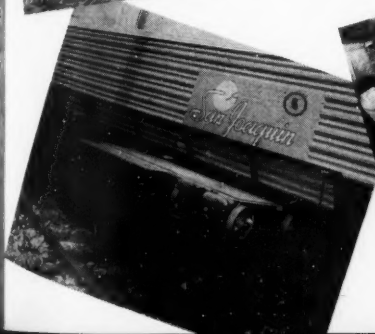
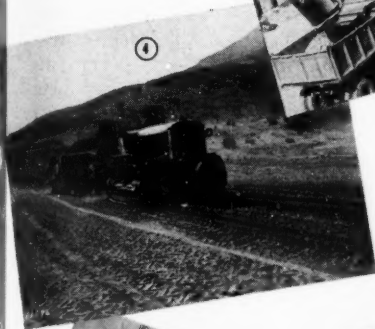
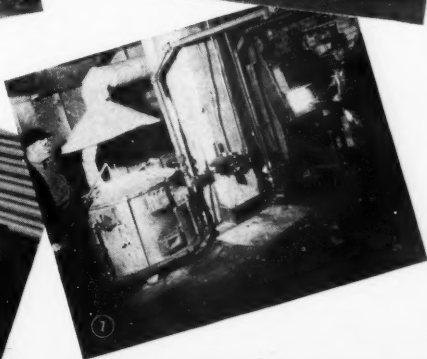
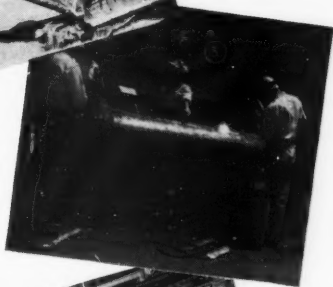
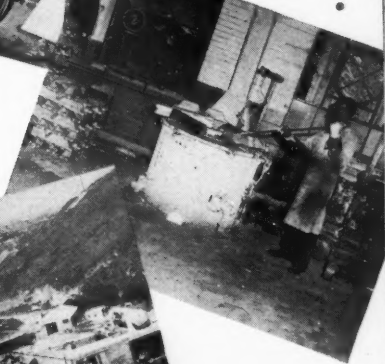
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INDUSTRIAL APPLICATIONS

- ① Mutual portable tinnerns' furnace making water tanks for trailers.
- ② Pre-heating aluminum ingots at Eastern Metal Products Co., N. Y.
- ③ A huge shovel in a quarry operation. Note butane tank on top.
- ④ Heavy-duty tractor powered by L.P.-Gas.
- ⑤ Tack welding in shell-head assembly jig.
- ⑥ Air conditioning ice engine slid out for inspection.
- ⑦ Pot furnace in Maine heat-treating plant.



DEHYDRATION

Look for New Profits In Dehydrating Field Crops

DEHYDRATION of agricultural crops is assuming increasing importance as a fuel market for LP-Gas distributors. It offers particularly desirable profit possibilities, as the deliveries are generally large, and most of the volume comes during the summer and fall, thus building up the load during the long slack period.

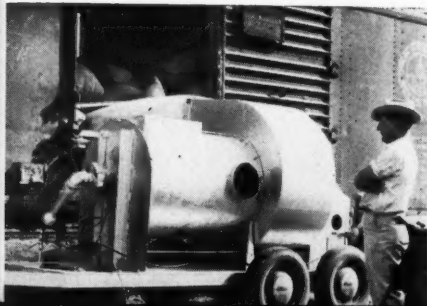
It is an easy market to sell. From the standpoint of the dehydrator operator, LP-Gas offers advantages over any other fuel. Even in areas served by natural gas lines, liquefied petroleum gas offers a better deal as it avoids laying pipes from the main, and paying utility standby charges during idle months.

Drying peanuts after they are loaded into boxcars with Farm-Mor dehydrator.

By Carl Abell

As compared with oil, the advantages of LP-Gas are even greater. The soot and pollution produced by oil burners makes it necessary to use indirect heat (heated air) for dehydration to prevent damage to the material being processed. This entails a big loss of efficiency. The clean burning qualities of LP-Gas permit direct firing—that is, the products of combustion which contain all of the heat produced by the flame pass through the material being dehydrated.

Until a few years ago, sun-drying crops, such as hay and prunes, was deemed superior to mechanical dehydration. But no longer. Mechanical dehydration produces a superior product which brings more money, at less cost than sun-drying. The finished product of the dehydrator is favored by the health authorities because it is free from dirt and other wind-borne contaminants which are unavoidable with open-air drying in the sun.



Farmers are finding that they can produce more meat and milk at less cost if they field-chop and dehydrate their forage crops. Mechanical dehydration preserves valuable nutrients and vitamins which are lost in sun-drying. Farmers also experience less crop loss, as the new curing processes make them independent of the weather during the drying period. Molding of forage and the consequent crop loss or sickening of animals are prevented.

Dehydration of such food staples as potatoes, onions, apples, etc., prevents spoilage in long-distance transit, makes them available for year-round use anywhere on earth, and permits transportation at minimum cost for military and export purposes.

Improves Quality, Increases Value

Controlled curing by heat improves the quality, increases the value, and reduces spoilage of such crops as cotton, tobacco, hops, nuts, sweet potatoes, and peanuts.

Dehydration is an economic necessity in the production of rice. It insures other grain crops against spoilage due to excess moisture content prior to storage, and improves the germination and keeping qualities of seeds.

With the development of improved burners and automatic control equipment, the production of farm-size dehydration units, and the increasing knowledge of dehydration practices and benefits, this market is due for a rapid in-



Grain dehydration is big business in many farming communities.

crease. Furthermore, it will never be centralized in the large industrial areas. The dehydration plants will always be located close to where the crops are grown. More and more individual farmers will come to consider these plants as necessary equipment on their own acres. It is a growing market which will not be taken away from the LP-Gas distributors by any other development which has appeared to date.

Several typical dehydration installations handling important crops are described in detail in the following pages. These are followed by a large number of other crop applications, some of which will certainly be worth promoting in every rural community. We suggest that all distributors secure as much information as possible on the dehydration of the crops produced in their own localities. It would also be worth while to work with the manufacturers of dehydration equipment in selling units to create an additional market for products.



Kiln-drying lumber in
a small prune dehy-
drator near Saratoga,
California.

Drying of Farm Products May Be Dealears' Biggest Load

THE use of dehydrators for drying prunes has probably progressed farther than is the case with any other formerly sun-dried fruit crop. The reason is climatic. Most of the prunes are grown in valleys west of the Coast Range mountains in California and Oregon. These valleys are subject to considerable fog during the drying season, as well as occasional rains.

Prunes

Sun-drying under these conditions presents the hazard of damage to the fruit while drying, as the condensation of the fog, or wetting by rain, promotes moulding. It is, therefore, necessary during sun-drying to stack the trays on nights when fog or heavy dews are expected, and when it rains,

spreading them out in the dry-yard again when the sun comes out. The labor cost involved is high.

Prune dehydration got its first big impetus following the 1919 season, when an unseasonable, four-day rain ruined most of the crops. The University of California took the lead in developing dehydration equipment and processes to prevent repetition of this disaster. Most of the fruit dehydration plants now used in the drying of all fruits in the West follow one or the other of the two basic designs worked out by the university engineers. These designs may be secured from the College of Agriculture, University of California, Berkeley.

Experience has shown that throughout the fog belt, in an aver-

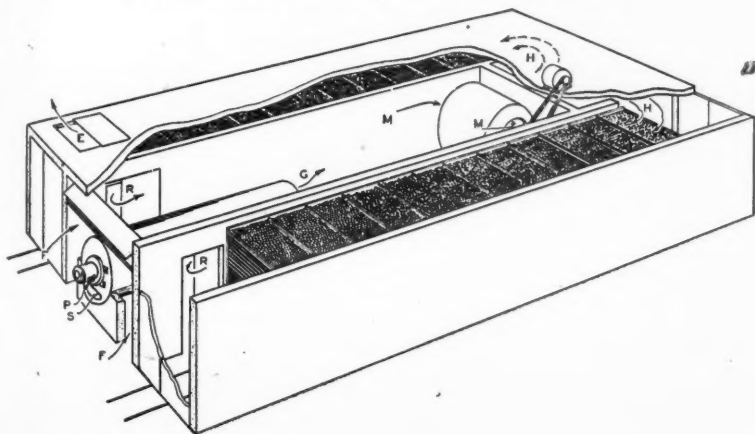
age or an abnormally wet season, dehydration costs less than sun-drying. The dehydrated fruit is more attractive in appearance, better in texture, has brighter colored flesh, and is free from the "chocolate" appearance under the surface and the accompanying impaired taste that are induced by atmospheric moisture in the sun-dried fruit. Since the general quality is higher, the dehydrated fruit almost always brings the top price.

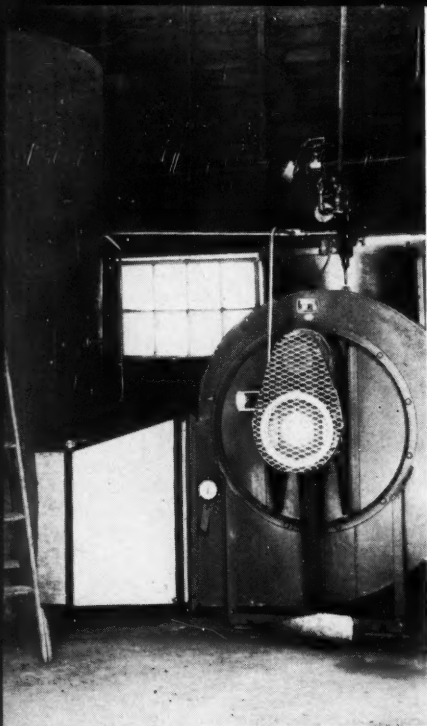
A dehydration plant represents a substantial investment, so it is desirable to keep it operating through as long a season as possible. Many growers have installed their own dehydrators, to eliminate the expense of hauling the fruit to the large, centrally-located plants which do custom dehydration for

the growers who do not have their own facilities. Many of these private plants do custom dehydration for their neighbors, besides filling in as much time as possible outside the prune season by dehydrating apricots, which ripen earlier than prunes, and walnuts, which ripen later. Some plants are also used outside the fruit season for drying onions, garlic, etc., and several are even equipped for kiln drying lumber during the months outside the harvest season. The latter is true also of some of the big central fruit dehydrating plants, which operate continuously on either fruit, produce, or lumber.

A typical ranch dehydration plant is shown in the accompanying pictures. It is operated by Bozzo Bros., near Gilroy, Calif., in

Double-tunnel, counterflow, direct-fired dehydrator with centrifugal fan: E, exhaust air; F, fresh air; G, gases heated in furnace; H, hot air delivered by fan to tunnels; M, mixture of fresh air, gases heated in furnace, and recirculated air entering fan; P, primary fresh air for initiating combustion in the furnace; R, recirculated air; S, secondary fresh air for completing combustion in the furnace.





**Burner and blower installation,
batch processing walnut dehydrator,
A. H. Vetter ranch, Stockton, Calif.**

conjunction with their 80 acres of prunes. The design is based on the university counterflow plan, with the burners and blower in a central tunnel supplying heated air to the two outside tunnels through which the fruit passes.

Heat is produced by LP-Gas, which is fed in liquid form to two Ransome self vaporizing burners. These are equipped with solenoid operating valves, remote-controlled, and with automatic shutoffs in case of stoppage of either flame or the

fuel supply. If the temperature goes up or down beyond a minimum tolerance, or if the blower stops, a thermostatically-controlled horn warns the operator.

The control panel is at the other end of the central tunnel, where wet-and-dry-bulb thermometers enable the operator to control the temperature to the desired 165° for prunes, or appropriate temperatures for other products being dehydrated. A certain amount of used air is recirculated to maintain a reading of 150° on the wet bulb thermometer. This recirculation accomplishes two things. It saves fuel, as the air still retains considerable heat. It also prevents too rapid dehydration, which would have the effect of "case-hardening" the fruit—drying the outside more rapidly than the moisture near the center could disperse outward, leaving a wet center which would ferment and leave an undesirable flavor in the fruit.

In preparation for dehydration, the fruit is washed, scalded slightly in an LP-Gas-heated vat to check the skins and facilitate drying, then spread out one layer deep on the trays. The trays must be made very accurately, as the channels formed by stacking 24 trays on each of the eight cars which form the loads in the tunnels must be continuous to permit uninterrupted circulation of air.

When a car of finished fruit is removed from the dry end of the tunnel, all cars are moved forward one position, and a car of fresh fruit is wheeled in at the beginning

TABLE 1

Maximum
Recommended Air
Temperature °F

Product	Maximum Recommended Air Temperature °F
Apricots	155*
Freestone peaches	155*
Clingstone peaches	160*
Nectarines	155*
Pears	140*
Golden-bleached raisins	150
Black Mission figs	140
Prunes	165

*These figures to be used only if the fruit is dried to a moisture content not below 25%.

end. The washing and loading is done automatically. The dehydration period is from 12 to 15 hours, depending on atmospheric humidity, size and sugar content of the fruit. For highest quality product, the moisture content in the finished prunes should be 18%.

Capacity of the Bozzo Bros. plant is between 8 and 10 tons of dried fruit per day, and fuel consumption is close to 200 gals. per day.

Other fruit crops require special preparatory operations before going into the dehydrator, and different techniques during drying. Table 1 (from the University of California Bulletin 698 on Fruit Dehydration) gives the recommended drying temperatures for the fruits most commonly dehydrated.

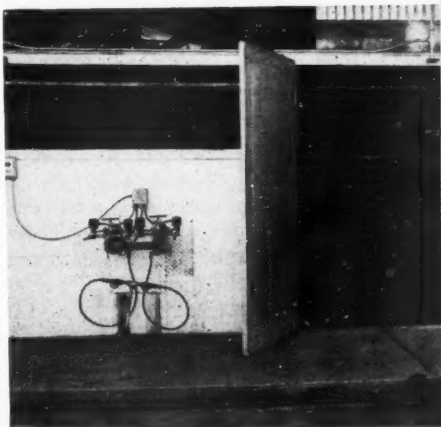
The Bozzo Bros. plant finishes the season by dehydrating walnuts for neighboring growers. While the "production line" type of dehydrator is not as economical for walnuts as one of the simpler batch operation nut dehydrators, small

growers can save money by using this method, as compared to owning a nut dehydrator which the size of their operation does not warrant.

Walnuts

Dehydration of walnuts is carried on primarily to improve the market quality and price of the nuts. Walnuts with clean shells and light colored skins on the meat bring the grower from 2½ cents to 3 cents more per pound than nuts with dark skins and black stains on the shells. This amounts to from \$50 to \$60 per ton, and this premium makes it worth while to go to considerable extra expense

Burner installation, electrically operated by remote control and automatic safety switches, Bozzo Bros. dehydrator, Gilroy, Calif.



to put the product in the top-quality bracket.

Walnuts grow with a pulpy, sap-filled hull around the shell. Walnut juice contains a very high amount of tannic acid. If allowed to remain on the tree until the hulls dry and the nuts fall off, a tannic acid stain forms on the shell, and a certain amount of the acid penetrates through the shell, adding a slight discoloration to the inner skin, and also imparting a perceptible flavor to the nut.

For top quality, the nuts should be knocked off or shaken from the trees as soon as they are mature, and before the cracking hulls start to dry. (At this stage the inner skins are white). They are taken immediately to the processing shed where they pass through a machine which removes and flushes away the hulls. The nuts are then thoroughly washed to completely remove the tannic acid, then they pass over a sorting belt where women remove the damaged and imperfect nuts as they pass to the dryer.

Low Heat Utilized

The special walnut dryer is a batch-loading hopper with a wire mesh bottom, tight sides, and open top. Air heated at 110°F is forced through the filled hopper by means of a blower. Drying time varies from about 24 hours at the beginning of the season to as little as 12 hours toward the close. This reduction of time is due to natural drying as the nuts hang on the

tree. (The early nuts bring the best price.)

The modern nut dehydrator has an electronic control to keep the temperature uniform, and an automatic protector system to shut off the fuel in case of an electric power failure, and to close all valves if the fuel supply runs out. This makes it safe to start up again when power or fuel is again available. Due to the short operating season, LP-Gas is the favored fuel.

Apples

In the past, it has been customary to dry apples in "evaporators," which operate on a principle similar to the nut dryer. The evaporator differs in design, however, due to the differences in operation necessitated by the nature of the apples. The prepared apple rings are piled on the screen on the slat floor of the drying kiln, the heated air traveling upward through the fruit to accomplish the drying. As the rate of drying differs at the various levels, it is necessary to turn the pile over with a shovel a number of times before drying is complete.

Most of the evaporators still in use have been equipped with overhead suction fans to speed up the air flow. This hastens the drying by about one-fourth. It is significant to note that most of the recently installed apple dehydrating plants have been of the counterflow tunnel type, similar to the prune dehydrator.

A new type of dehydrated apple has recently appeared on the mar-

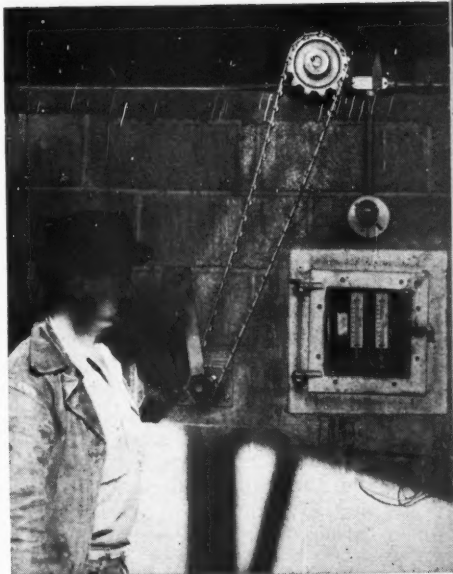
ket. It is in the form of fine granules, which, when cooked, retain more of the flavor and appearance of fresh applesauce. This is produced by a quick-dry process similar to that used in the dehydration of shredded vegetables such as potatoes, carrots, onions, etc.

Field Crops

Probably the most extensive use of dehydration, or heat-drying, of field crops at this time is being done in connection with cotton and forage crops. Special information on cotton drying is contained in the article on "Cotton" in this issue.

Dehydration of alfalfa preparatory to the manufacture of alfalfa meal and pellets is a large-scale operation, extending through a long season. Far more widespread, and with present and potential markets available to a far greater percentage of LP-Gas distributors, is the rapidly growing practice of drying forage crops with heat. In this line, alfalfa, clover, mixed hay, and sorghums seem to have received the most attention, with extensive development of suitable dehydrating equipment in various parts of the country.

Dehydration is of particular advantage in the leguminous and sorghum fodders. In the former, it is customary to partially field-dry the crop to about 35% moisture content, putting either the long or chopped hay through the dehydrator to complete the curing. This retains the bright green chlorophyll and a high percentage of



The control panel of a modern tunnel-type dehydrator. Michael Bozzo at the wheels.

carotene, and reduces loss of feeding value by preventing the shattering and loss of leaves—the most valuable part of the fodder—which is inevitable in handling field-dried leguminous hay. Methods have been developed for drying the hay either loose or in bales.

Chopped sorghum fodder similarly retains a higher feeding value when dehydrated, due to the retention of more of its sugar content. Further improvement of feeding value is obtained by dehydration, grinding, and pelleting the sorghum fodder. This can be done

in the standard alfalfa pelleting setup. The pellets can be stored and handled in bulk, just like grain.

Special equipment designed for dehydration of forage crops ranges all the way from large-scale, permanently installed, continuous processing plants to portable trailer-mounted outfits supplied with fuel in replaceable ICC cylinders, for both heating and power to drive the blower. Because the latter are extremely versatile, are adaptable to a large number of crop drying applications other than forage, and may be moved to any location as required, they are of special interest to a large number of rural LP-Gas distributors. For this reason, they will be discussed in connection with several special applications later in this article.

Grains and Seeds

The use of combines to harvest grains has led to drying problems which did not exist in the old days when grain was air-dried in the windrow or stack—and the rain could ruin everything. Rice and sorghum grains—milo, hegari, etc.—frequently come from the harvester with crop-moisture contents as high as 25% or even 27%. Like any other grain, this must be reduced to a maximum of about 14% in order to prevent moulding or fermentation and heating, either of which would result in loss of crop value. Other grains, including corn, frequently need a little extra drying.

This may be done in small-scale plants located on farms, or in

large, central plants. If the grain is to be fed on the farm where it is produced, a dryer located on the farm should be seriously considered, as it eliminates transportation costs to and from the commercial dryer. For rice, which requires extremely careful operation to prevent loss of milling quality, it is generally better to do the job in a larger plant, where high-speed throughput is possible under thermostatically controlled temperature, and under the supervision of a highly skilled operator. Batch drying on the farm is possible, with satisfactory results, but all the angles of quality control and cost should be considered before putting in the necessary investment.

There is probably no group of farmers to whom proper curing of grain and other seed crops is so important as the specialists who grow seeds such as hybrid corn, cotton, small grains, etc. The germinating quality of their product is all-important, and its loss due to moisture in storage would be a major disaster. Their drying problem is also complicated by the fact that too much heat during drying would also affect germination. LP-Gas is perfectly adapted to this type of dehydration because of the close temperature control which is attained by modern electronic apparatus applied to the burners.

Peanuts

The increasing demand for peanuts and peanut oil products has led to a large increase in the production of this crop. The largest

peanut producing areas are in climatic zones where weather hazards during harvesting season are relatively high. Natural curing of the crop requires from 10 to 20 days' exposure to the sun, and rain during the drying period generally results in substantial losses.

Peanuts are a dual-use crop. The vines make valuable hay, which is a by-product to production of nuts. Both the hay and the nuts are improved in quality by dehydration. Artificial drying practices vary widely, as it is possible to process the nuts and vines together before threshing, or separately after threshing. The nuts may be dried separately, either in bulk by batches or in continuous processing equipment, or in sacks. The price of the nuts depends in part on moisture content, being scaled down, or "docked" for moisture content in excess of the desired storage moisture content of 10-13%.

Sweet Potatoes

Sweet potatoes undergo large losses in storage due to decay from attacks of black mold and dry rot. This may be held in check by proper dehydration when the tubers are placed in storage, followed by controlled temperature, humidity, and ventilation. This requires suitably constructed storage rooms equipped with permanently installed heating and ventilating systems with thermostatic controls. Ideal storage temperature is between 50° and 70°F, and deterioration results if it is allowed to fall below this range.

TABLE 2. DRYING SCHEDULE

Crop	Moisture Content For Storage %	Temperature* Range °F
Grains	12-14	160-180
Peanuts	10-13	118-125
Peanut Hay	15-20	168-184
Rice	12-14	110-120
Ear Corn	13-15	115-125
Hay	15-20	168-184
Fescue Grass	12-15	125-130
Hegari	10-15	150-170
Martin Milo	10-15	150-160
Sweet Potatoes	10-13	125-135
Oats, Threshed	10-13	150-160
Clover Seed	11-13	115-120
Alfalfa	10-15	168-180

*Temperatures not for germination.

Sweet potatoes for market, whether immediately after digging or following storage, should be cured with controlled heat to effect proper conversion of starch to sugar. This improves the palatability and food value.

Because of their high productivity and high carbohydrate content, sweet potatoes are assuming increased importance as stock feed. For prolonged use in winter feeding, they require dehydration in most production areas. The availability of dehydration and temperature controlled storage also extends the production zone northward into regions where their production for stock feed has not been feasible in the past, due to storage problems.

We are indebted to Charles F. Bishop, chief engineer, Southwest Industrial Heating Engineers, Dallas, for the drying schedule of the more common farm crops shown in Table 2.

One of the most interesting ap-

plications of the field crop dehydration process to other commodities is also reported by Mr. Bishop. This is the dehydration of cattle manure for the production of packaged fertilizer which is free from weed seeds and insect pests. The Gro-Tex Co., of Houston, has built a very considerable business in this product, using a specially adapted "Farm-Mor" portable dehydrator.

The manure is partially dried, to a moisture content of 25%-30% in open piles. It is then put through a shredder to cut it to fine particles, after which it goes through the dryer at a temperature of 200°. This kills all seeds and insects, and at the same time completes the dehydration. Capacity of this par-

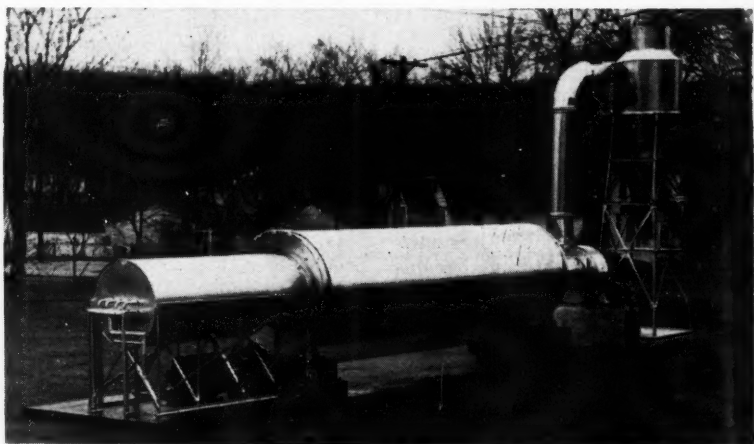
ticular unit is approximately 1 ton per hour.

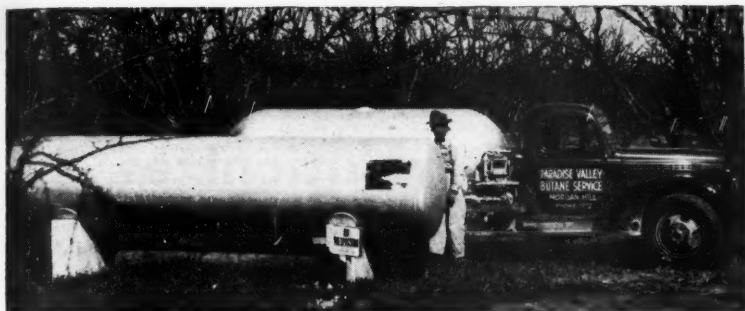
On account of the availability of the raw material in practically every locality, and the universal need for such a product, plus the fact that transportation costs would impose a needless burden on the user, the installation of processing plants in almost every locality would appear to offer a fertile field for the promotion of new outlets for LP-Gas by practically every distributor.

Vegetables

The production of the export type of dehydrated vegetables mentioned in the previous paragraph is largely a commercial operation, which

This dehydrator installed at Kansas City municipal farm for drying alfalfa and garbage for hog and chicken feed. Other uses are drying corn, cereal grass, sweet potatoes, and beets. Manufactured by McGehee Corp.





Fuel supply tank, Bozzo Bros. dehydration plant,
Gilroy, Calif.

at present offers limited opportunities for the average LP-Gas distributor. It is quite likely that in the future there will be farm-size plants available for these operations.

Learn About Dehydration Equipment

Dehydration offers one of the greatest opportunities for LP-Gas distributors to increase their volume during the slack months of summer and fall. Extensive technical knowledge of the subject is not at all necessary.

There is a wide range of standardized equipment already available for most of the major crops. Many suitable units are produced in most localities. The burner manufacturers as well as the manufacturers of the complete dehydration equipment offer engineering service in the design and construction of dehydrators for any special pur-

pose, or of sizes beyond the range of standardized equipment.

To tie in with the service already rendered on customers' farms, LP-Gas distributors should be familiar with the general types of individual farm-size dehydrators likely to be of value in their own territories. It is just as logical to have the local agencies for such equipment as it is to stock and sell domestic appliances. Particular attention should be paid to the portable units, for which there is a wide local market, and which consume LP-Gas for both heat and power. Several distributors in the South are renting portable dehydrators to their customers. This provides direct revenue from the equipment and an important market for gas, and frequently leads to equipment sales to customers whose farming operations justify the ownership of their own dehydration plants.

Gas Revolutionizes Cotton Production

THIS is a story that begins in the middle. It concerns the part played by LP-Gas in saving an industry that was literally "dying on the vine." It is tremendously important—the production of cotton. The economic and social welfare of a large portion of our Southern population has depended on cotton for many generations.

The story begins with the development of the cotton picking machine. It carries on through the building of a new demand for LP-Gas throughout the cotton belt. This demand is already large, but in the next few years it will expand a great deal more.

Mechanical Picker First Condemned

The mechanical picker had rather rough sledding during its first few years. It was under violent attack by well-meaning but inadequately informed sociologists, who predicted impoverishment and starvation for the already underpaid and undernourished farm labor families of the South. Actually, they were talking about a condition that was currently passing out of existence.

The field labor supply was rapidly moving cityward and northward in response to the siren call of the more abundant life. There was no longer enough help to produce the cotton that was needed.

Labor Problem Affected

The factor which was the real obstacle to the mechanization of cotton picking grew out of this same labor migration. The growing cotton, under the then prevailing methods, required about as many laborers to chop the weeds out of the rows as did the picking. With the labor supply disappearing, the cotton could not be properly weeded, which lowered production. One picking machine could cover as many acres as could be picked by 20 to 25 hand pickers, if they had been available, but the cotton was graded down and sold at a lower price because the machine gathered a large amount of trash along with the cotton. Tractor-drawn cultivators could keep the weeds out from between the rows, but they could not get in between the plants and take out

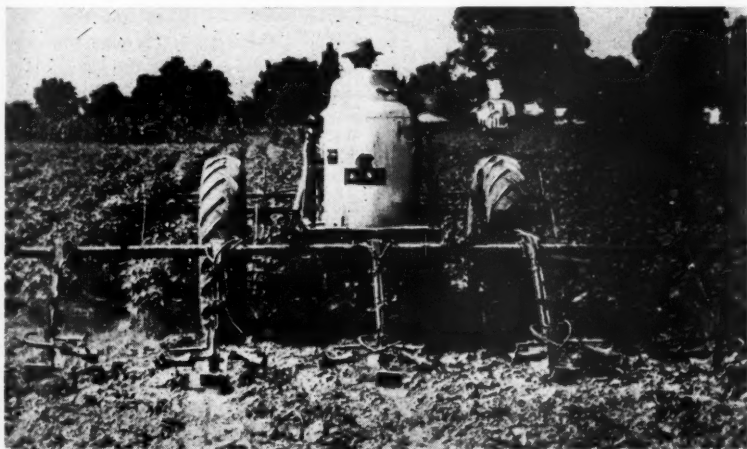
the weeds that did the most damage.

Price C. Lemore, of The Oaks Plantation, in Mississippi, decided that if mechanization could take the place of hand labor in picking, some form of mechanization could also be devised which would replace the rapidly disappearing human labor in production. He found that with a blow-torch he could kill off young weeds without damage to larger and thicker-stemmed plants which were growing among them. Since the young cotton plants outgrew the new weeds and since their thick stalks, protected by heavy bark, would withstand more heat than the weeds, it would be possible to keep the weeds burned out as they appeared *above ground* without harming the cotton. He built a tractor-drawn machine equipped

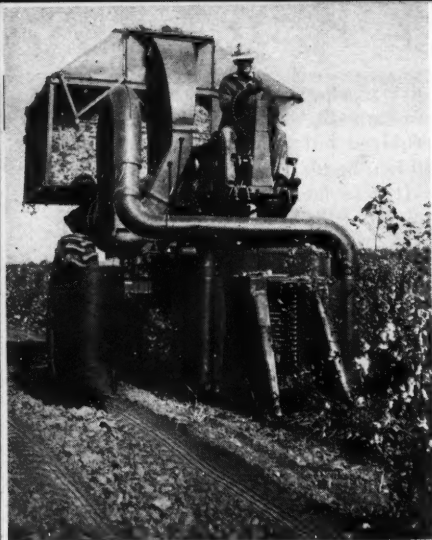
with torches, which he could drag through the fields, replacing the required but non-existing force of 50 hoe hands.

It was later discovered that by shielding the young plants at intervals by means of guards attached to the rim of a wheel which passed along the row, and then burning severely, the cotton could also be thinned. This eliminated the final operation which had formerly required hand labor.

That was the beginning of "flame cultivation." It was only the beginning of the profits which it produced. Quite accidentally, and to the amazement and delight of the inventor, it was discovered that the flame cultivator performed three other highly desirable services. His fields were unusually free of boll



The flame weeder kills the weeds but does not harm the cotton; does the work of 30 to 50 hoe hands.



The cotton picking machine does the work of 25 hand pickers. To make mechanized production practical, the industry has developed much LP-Gas-operated equipment.

weevils. The insects, which were feeding on the young cotton plants, were shaken off by little bumpers attached to the burners, and most of them were killed. Thousands of seeds of grass and weeds were cooked by the flame, so they never had a chance to sprout. Finally, the flame accomplished something in cotton plants themselves which had balked plant breeding scientists for years.

In order to get the cotton bolls higher off the ground where they would not be damaged by splashing mud during heavy rains, and to grow them at a height which could be reached by the steel fingers of the cotton picking machine, these breeders had been attempting, but without success, to develop new

strains of cotton which would branch higher up the stalk. The flame weeder did the trick. Passing through the fields when the cotton was just beginning to branch, the flames seared the tender tips of the low side sprouts, causing the plants to form their main branches several inches higher on the stalks.

With insects and weeds under control, Mr. McLemore was able to produce twice as much cotton per acre as his non-mechanized neighbors. He could pick it by machine and gather a larger percentage of the bolls from the higher branching plants. Without polishing a hoe handle, he was able to produce a bale of cotton with only 11 man-hours of labor, where hand-labor production required 235 hours. And his cost per bale beat that of his neighbors by \$35.

LP-Gas proved to be the ideal fuel for flame cultivation. Since the use of these flame weeders required a supply of LP-Gas on the farm, it has been but another step to equip cotton field tractors and picking machines to burn the same fuel. The cotton belt states near the oil fields are now among the leading markets for tractor conversions.

Unit is Convertible

The International Harvester Co.'s cotton picker, which is the one most widely used, is built on a modified Farmall Model M tractor. This may be removed from the picker and used for general farm work during the seasons when the picker is not in use. Many of these machines

have been equipped to burn LP-Gas. The fuel tank may be side-mounted or used in place of the regular gas tank. In either case, it is not accessible for filling when used with the cotton picker, so it is moved to brackets under the hopper of the picking machine.

(Editor's note: The use of flame cultivation did not stop with cotton production. It has been applied with equal success to many other row crops, and more recently has been used with outstanding results for the control of weeds and insect pests in field crops such as alfalfa. See special section on Flame Cultivation in this issue.)

The picking machines introduced certain other problems, in the solution of which LP-Gas is finding a large and growing market. Moisture in the picked cotton causes rapid discoloration and loss of strength in the fiber. The barbed steel picking spindles will not gather the cotton from the bolls if they are dry. It is therefore necessary to moisten them constantly with a fine spray of water. This is soaked

up by the fiber, and carried on into the hopper. Further moistening sometimes takes place on account of dew or rain. If the water content is too high, the cotton clogs the saws in the gins, causing expensive and troublesome delays in the ginning.

In addition, there are always a certain amount of leaf fragments and other trash which the machines gather along with the cotton. This will not separate out in the cleaner through which the cotton passes to the gin if the cotton is moist.

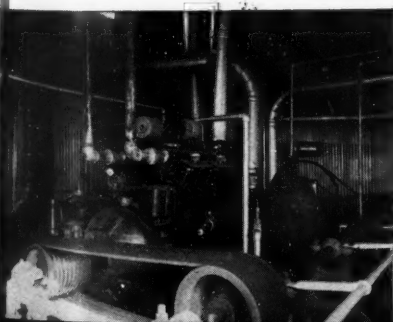
These various conditions make it necessary to dry the cotton with heat before it is fed into the cleaning and ginning machinery. LP-Gas provides the ideal fuel for this use.

Fast Processing Desirable

Cotton is worth more in the market if it is dropped to a normal moisture content of about 7% within a very short time after picking. This prevents discoloration and weakening of fibers due to fungus growth. Also, if the damp cotton lays in the load long enough to start fermentation, the oil from the seed seeps out and discolors the fiber. These conditions make it necessary to put the cotton through the drying and ginning equipment as quickly as possible after picking.

The cotton is picked up out of the field wagons by a suction tube, and carried to a "dropper," where it is separated from boll hulls, leaves, and other coarse trash. It is then delivered to the hot air duct, which carries it through the final cleaner and distributes it properly

LP-Gas-fueled engine provides power to operate drying and ginning machinery at Wolf Island, Missouri.



into the series of ginning units. The temperature in this air chute is regulated to produce the proper degree of drying. Too much heat makes the fiber brittle, and strength thus lost can never be regained.

In most gins, the air temperature and drying rate in the air chute are controlled by the operator. One burner is operated at a predetermined standard output by automatic controls at the master panel. The heat from the other burner can be increased, decreased, or shut off by the operator through a number of auxiliary control switches located at strategic points in the gin-room.

In these installations, the accuracy of control depends entirely on the knowledge and skill of the operator, who bases his judgment on the way the cotton goes through his gin-saws.

Burner Capacities Vary

Standard burner equipment for commercial gins ranges from 1,-

A 1000-gal. LP-Gas tank provides 100 to 240 gals. of fuel per day to supply heat for drying and cleaning cotton in a San Joaquin valley, California, gin. This plant sits practically on a natural gas main.



500,000 to 3,000,000 Btu per hour capacity. They do not ordinarily burn that much fuel, as it is seldom necessary to operate them at full capacity. A 1,500,000-Btu burner set will ordinarily consume from 6 to 10 gals. per hour, while the 3,000,000-Btu burner uses double that amount, or 100 to 240 gals. per day, depending on weather and moisture content of the cotton.

In many cases, gin operators have found it advantageous to provide their own power. Since LP-Gas is available for producing heat, it is not necessary to duplicate the storage equipment—they simply connect the engine to the same tank. This reduces the investment in power equipment and eliminates the expenses incident to installing and maintaining heavy power lines.

While the "one mule and one family" method of cotton production is rapidly disappearing, mechanization of cotton production is still far from complete. Even in Arizona and California, where the most mechanization has been accomplished and the larger farms range between 5000 and 30,000 acres, more than half of the cotton is still picked by hand.

With the government asking for a 60% increase in cotton production this year, and still more of the field labor moving into year-round jobs at higher pay in industry, the trend toward mechanization of production operations must go up sharply. It is a good market for LP-Gas distributors to cultivate.

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POULTRY

Cold Room Brooding Is a Science with LP-Gas

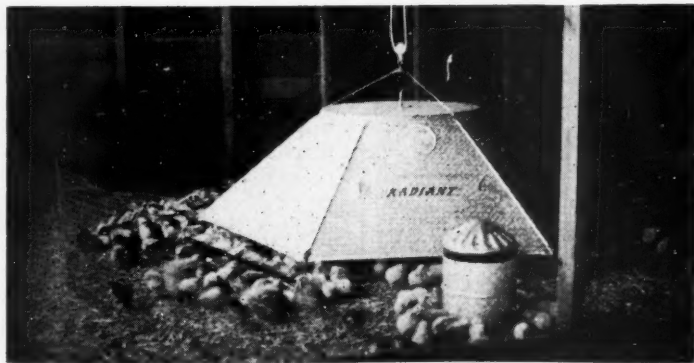
By Norman Brown

Manager, Bottled Gas Ltd., Vancouver, B. C.

THIS is a basic guide to poultrymen who have had experience with other forms of fuel and are now thinking of using LP-Gas and the cold-room brooding method. Application of this system is so different from the hot-room principle that it must be thoroughly understood to insure dividends.

This company believes that LP-Gas and cold-room brooding give young birds the healthy start in life that decides, at the outset, between a profit and a loss for the owner.

Why? Because it comes the closest to duplicating Mother Hen's theories about "bringing up baby chicks." Poultrymen generally agree that the hen does a better job of raising healthy chicks with a minimum of mortality than man's first efforts in trial and error. The only trouble with the mother hen, actually, is that she



The Wood brooder replaces the mother hen, allowing chickens to come and go at will and as temperature conditions influence them.

cannot do her brooding on a large, commercial scale.

On other points, however, she manages fine. She isn't greatly concerned about where the eggs are hatched—in the hen house, woodshed, or under the wagon; she doesn't become frantic about summer or winter temperatures—she just sits and maintains a constant, unvarying body temperature—all without thermostatic control.

So this is what happens. The baby chicks are forced to get out in all kinds of weather to satisfy their hunger and thirst—they become acclimatized in a hurry. When they get cold they return to the dependable warmth of their mother. As a result, they feather out rapidly, become sturdy, their beaks and legs turn yellow instead of pink. In a very little time they are on their own.

Cold-room brooding with LP-Gas duplicates this process. It provides cool, fresh air in the brooder house—and when the chicks become cold from their foraging excursions they simply return to the commercial version of their mother, the LP-Gas-fired hover.

A shortcoming of competitively fueled brooders is fluctuating, un-



One 500-gal. storage tank serves 10 brooder houses in this British Columbia installation.

evenly distributed heat. Thermostats are used but they are subject to the vagaries of a fuel that may be clean or dirty, wet or dry, and which has to have exactly the right draft. If the wind changes during the night the flame frequently goes out, or burns so bright that the operator occasionally loses both floor and brooder house. In short, no thermostat could adequately cope with the variations of such fuel and weather conditions.

With LP-Gas and cold-room brooding the only part of the brooder house that is warm is underneath the hover canopy. First, no draft is necessary as there are no flues. Second, it is fed by a fuel that is distinguished by its constant heat value. It is fed to the burner under steady pressure, self-generated in the storage tank and properly regulated with precision equipment.

Third, the thermostat will re-

The author of this article, Norman Brown, is manager of Bottled Gas Limited, Vancouver, B. C., distributors of "Rockgas." A poultryman himself, Mr. Brown prepared exhaustive information as an aid to farmers and as a sales brochure for Rockgas. It is an excellent presentation of the case for cold-room brooding. Space permits only a digest of the entire discussion.—Editor.

spond to a 2° fluctuation in temperature. Fourth, the heat from the burners is reflected from radiants directly to the floor beneath the hover and to the backs of the chicks.

House is Ventilated

As a result, the air in the brooder house remains sweet and clean, house ventilation is not only encouraged, it is a prime requisite.

Tests have proven that mortality, in every case, is less than that with other fuels.

Can chicks take the cold? We have seen them darting in and out of the hover in January with the temperature down to 11° F.

The season of the year during which the poultryman conducts his brooding operations will determine the cost of fuel. Naturally, it requires more fuel to brood in January than it does in June.

Electric rates vary greatly in different districts so a price comparison would not be fair to the competition. Also, when power failures occur there may be heavy losses for the operator. There is never a power failure with LP-Gas.

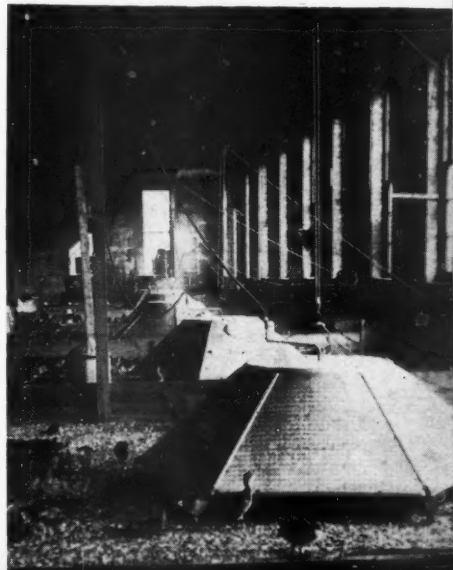
Gas brooding should cost about 30% less than oil and will also eliminate laborious cleaning of burners and filling of oil cans. Our customers tell us that even if gas cost twice as much as it does, the results in improved, heavier and healthier chickens would be worth while.

Our own company handles the A. R. Wood radiant heater which

is guarded by many safety features and provides positive action in operation. The brooder units are equipped with ropes and pulleys for lifting out of the way between brooding periods.

Thermostatic control is so accurate and practical the manufacturer recommends that the temperature be dropped 2° per day after the first two or three days of brooding. Thermostat dial settings are generally started between 90° and 100° (depending on the season and outside temperature). The birds are watched for their reaction to brooder heat and adjustments made upwards if they crowd too close, or downward if they are driven out. They should settle com-

A battery of A. R. Wood brooders in large poultry undertaking.



fortably between inner and outer edges of the canopy.

A guard is used around the unit to teach the chicks where to find warmth. It is placed fairly close around the brooder the first day—10 to 12 in. On each successive day it is moved further away and returned at night. Within a few days the chicks will be fully educated and adjust themselves to temperature changes as nature intended, by running in and out of the hover.

We believe that cold-room brooding with LP-Gas has a great deal more to offer than systems used with any other kind of fuel. Since its introduction in western Canada in the past year and a half, poultrymen are singing its praise. Certainly, if it never does more, it eliminates much of the worry of the poultryman's operation and it gives him a better chance to make the profits for which he is striving—through better birds and reduced costs.

Economy Swings Dealer To Butane for Brooding

HIGHLY favorable comparisons between the costs of operating chicken brooders on LP-Gas and on oil were disclosed recently by an enthusiastic convert to butane.

W. W. Lawton, owner of Lawton Poultry Farm, Lena, S. C., states that he has been a butane consumer for the past year. "In that time I've discovered that LP-Gas has cut my operating costs \$500 per year below oil fuel," Mr. Lawton said.

He told J. L. Peeples, manager of Estill Gas Co., the supplying dealer, that the saving in fuel, time and labor was so great that he wanted the industry to know about it.

Mr. Lawton's letter to the Estill Gas Co., dated March 13, 1951, reads:

"As you know, over a year ago I changed from using oil brooders to using gas brooders. The saving in fuel, time and labor was so great that I want you to know about it.

"The average cost of oil for brooding with 500-chick capacity hovers was 1.75c per chick. The average cost of gas for brooding with 500-chick capacity hovers was 0.8c per chick. The records were taken on the same houses and broods were started every two weeks throughout the year. The saving in fuel alone amounts to \$500 per year on the number of broilers I raise.

"The saving in time and labor is another large item, but can be only estimated. Using oil brooders, it was a major job to clean the soot and carbon out of the burners and stacks after each brood. With the gas brooders, about all that is necessary is to dust them off.

"While there is always a fire hazard with any flame, the hazard is much less with the gas brooders. While using oil, I had two near tragedies with fire, but with the gas brooders, I haven't had the slightest trouble.

"Another point in favor of the gas brooder is the fact that with a cool room temperature the chickens apparently are sturdier and healthier. And, of course, the healthier the chickens, the more profit I realize.

"Taking all the facts into consideration, I wouldn't exchange gas brooding for any other method I know of."

Tobacco Curing Builds Off-Peak Load

DEALERS are beginning to realize the tremendous volume of off-peak summer fuel possibilities in the tobacco crop. There are approximately 500,000 curing barns for "bright" tobaccos amounting to more than a billion pounds annually. The value of the fuel used each curing season for this one type of tobacco exceeds \$25,000,000. The other types of tobacco with another billion pounds have an equal fuel potential.

As an average, each pound of tobacco uses $\frac{1}{2}$ lb. of gas during the curing season. The potential for LP-Gas is therefore well over 1,000,000,000 lbs. annually. This would amount to 25,000 tank cars of summer load.

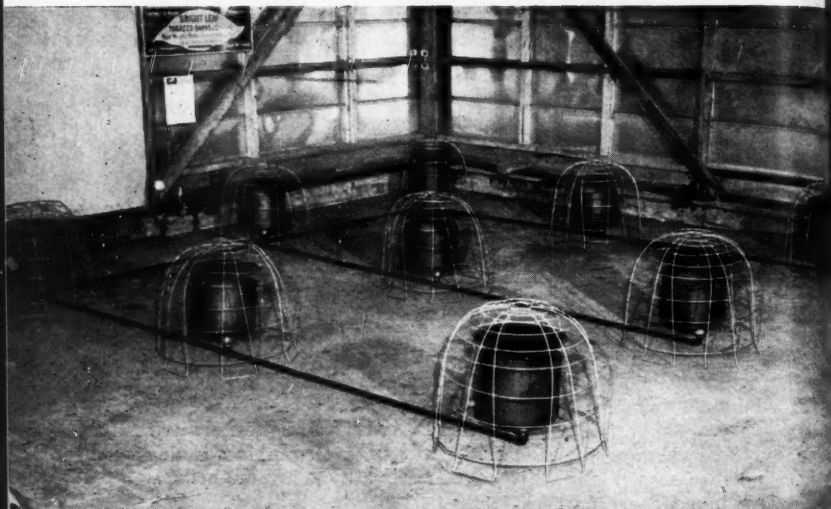
Practically all types of tobaccos either use, or should use, fuel to control temperature and/or humidity conditions to insure proper curing. Original development work with gas was done with "bright" tobaccos in the Carolinas by the Bright Leaf Industries, Charlotte, N. C. Bright Leaf Industries, however, gradually extended its coverage to other areas and other types of tobaccos with specially designed gas-fired curing systems to meet local requirements.

Extreme interest is being shown by the agricultural departments and experiment stations of the many tobacco growing states. Urgent invitations are being received from tobacco specialists of the various areas to help them prevent recurring tobacco losses due to inadequate curing methods.

Projects Planned

Work has been planned for Maryland, and for the Ohio and Tennessee valley regions growing various types of tobaccos, as well as Pennsylvania, New York, Wisconsin, Missouri, and adjoining areas.

Dealers from many sections report heavy demands from tobacco growers for "Bright Leaf" gas curing systems. These systems are being marketed through LP-Gas dealers. John K. Nelms of Oxford Auto Machine Co., Oxford, N. C., reports an unusually heavy demand from growers who have learned from neighbors of the money-making advantages of curing tobacco with a properly designed and engineered gas-fired curing system. Many of his present users state that the increased returns from better quality and heavier



Bright Leaf gas-fired tobacco curing system. Complete assembly for a 16-by 16-ft. barn. Note single automatic control unit. Also note thermostat bulb mounted on tier pole.

tobaccos more than paid for the fuel. His sales last year had to be curtailed when installations began to exceed the ability of Nelm's two tank trucks to keep up with the fuel deliveries required from nearby Rulane bulk plants. This spring a new 18,000-gal. bulk plant is being placed in operation at Oxford to enable them to take advantage of the demand they helped to develop over the last five years for gas-fired tobacco curing systems in this so-called "flue cured belt."

Bright Leaf Industries reports that growers of tobaccos in the

Connecticut valley are rapidly turning to gas curing.

While tobacco growing is usually associated in the public mind with the South, anyone who has been along the valley that extends from Saybrook to Hartford, Conn., and then up to Springfield, Holyoke, Deerfield and Greenfield in Massachusetts has seen the tremendous green tobacco fields and the big drying sheds. The industry in this area may represent a big opportunity for propane.

It appears that LP-Gas may provide the cure for two evils which have plagued Connecticut valley tobacco growers ever since start of this industry there:

1. Pole rot. This destroyed much of the crop.

2.
barn
In
hand
bacco
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2. Fires. These wiped out crops, barns and equipment.

In a tobacco shed of usual size, handling five acres' growth of tobacco, usual practice is to place burners eight feet apart. They thus give heat throughout the entire shed. During the 40 to 60 hours they burn continuously, the tobacco loses its moisture weight, and shrinks and dries. When LP-Gas burners are used, the process moves along at a regular, even speed.

The farmer thus can know that the tobacco is being cured properly.

The traditional method of curing tobacco in the Connecticut valley with charcoal burners has had many disadvantages. It made it nec-

BENEFITS OF TOBACCO CURING WITH LP-GAS

Clean, controlled heating.

Develops more weight.

Better grades of tobacco.

Takes less time.

Lowest costs.

No watching required (automatically controlled).

Requires no furnace,

" flue,

" stack,

" vent pipe,

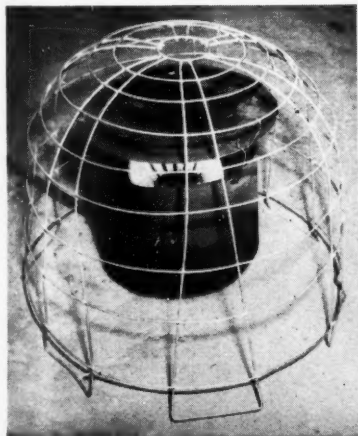
" special intake,

" electricity,

" handling of fuel by operator.

For barns of any size, shape, and construction.

Individual burner station with lighted burner, showing guard basket, heat spreader pan above burner, and sheet metal wind screen.



essary to keep a man all the time in each shed. This was to tend the fires and prevent a general conflagration from breaking out.

Curing of the tobacco close to the burners was accomplished faster than with tobacco farther away. This required moving the tobacco to avoid pole rot or over-curing.

The difficulty of controlling the fire of the charcoal burners created additional problems. As the outside temperature or humidity varied, it was difficult, or impossible, to adjust the charcoal burners to the varying conditions. Such conditions have led to lowering of quality of tobacco, and hence reduction in the farmer's return.

The elimination of fire hazard in West Suffield through use of gas instead of charcoal will be a tre-

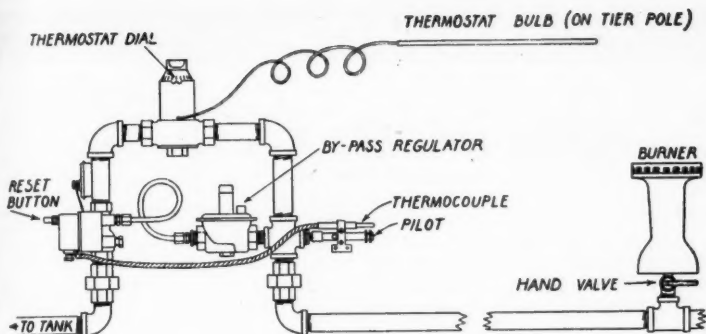


Above: Large "shade grown" shed belonging to Hathaway Stearn Corp. in West Suffield, Conn. The gas installation of 80 cylinders made by Rural Gas Service, Westfield, Mass. **Below:** Three curers operating from a 1000-gal. Rulane tank on the farm of E. G. Moss, Oxford, N. C. A tobacco curer installation by Pilot Butane Co., Kingstree, S. C., in a 16- by 20-ft. barn.

mendous gain for Connecticut valley tobacco farmers.

John W. Gallant, manager of the Hathaway Stearn Corp. tobacco farm in West Suffield, estimated it cost \$28 an acre to cure tobacco with the gas-fired units, against \$60 with charcoal burners. The use of gas also means a substantial saving in labor cost.





Schematic drawing of control assembly for tobacco curing systems.

One grower in this area estimates he will use 1500 gals. of propane per shed, and when installations can be completed in his 200 sheds, this grower will use 300,000 gals. each summer.

Gas curing saves the grower labor and improves the grade of his tobacco which means increased profits. The price received by the grower for his entire year's work

is greatly affected by the conditions maintained during the curing period. Poor curing can practically destroy the entire market value of the tobacco. Lack of controlled heat to reduce relative humidity during damp spells this past year cost growers many millions of dollars.

The dealer gets a steady customer with further possibilities of appliance sales and year-round sale of fuel. The producer improves his summer-winter ratio. Tobaccos of some declining-demand types can be properly gas cured to produce a grade that is in demand at more than double the price of the former grade. This can bring an entire section up from depression to prosperity. Everybody—grower, dealer, and producer—profits from the use of this modern gas-fired tobacco curing equipment.

Typical tobacco curing barn, bulk LP-Gas supply tank nearby.



IRRIGATION

Pumping with LP-Gas Is An Ideal Load

PUMPING with stationary LP-Gas engines is a highly efficient method of supplying irrigation water for farm crops. The actual efficiencies of various types of engines have been estimated and proved by theory and practice over a long period of time.

These efficiencies are given as follows: aircraft reciprocating, 25%; truck and bus, 28.2%; tractor engines, 21%; stationary diesel, 29%; marine diesel, 31%, and stationary gas pumping engines, 32% to 34%.

Thus on the basis of efficiency, alone, it is obvious that LP-Gas pumping engines have a decided edge. Add to that the fact that fuel costs

TABLE 1: COMPARATIVE COSTS OF OPERATING ONE 75 HP. PUMPING UNIT. (RIVERSIDE AREA OF CALIF.)

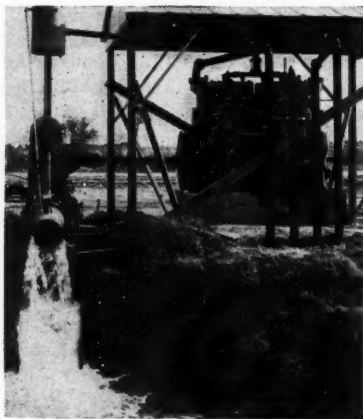
Hours of Operation	Cost of LP-Gas	Cost of Electricity
1st Hour	\$.48	\$ 1.23
10 Hours	4.80	12.32
50 Hours	24.00	61.60
100 Hours	48.00	103.40
240 Hours	115.20	200.62
360 Hours	172.80	254.62

Note: Butane cost assumed as .06c per gallon in 3000-gallon storage minimum. Electricity \$250 per month, or \$3000 per year. Monthly electric cost based on .06c (6 mills) per KWH, the agricultural service bracket—the lowest in the United States.

are substantially less than those of gasoline and as much as 36% less than that of electricity, as is indicated in a table of cost comparisons in one test case, LP-Gas' advantage becomes even greater. (See Table 1.)

The stationary diesel engine, the only close competitor on an efficiency basis, drops far down the line when the first cost and higher frequency of repairs are figured.

When the dealer approaches the subject from a "desirability of service" standpoint it becomes immediately apparent that irrigation pumping, alone, can contribute substantially toward taking up the slack in the summer load. A medium-duty engine, operating under average conditions and load, will easily consume 8 gal. of LP-Gas per hour for six months of the year. Heaviest pumping takes place between May and August.



Pumping with LP-Gas offers a big load for dealers in irrigation districts.

In areas where there is sufficient rainfall to eliminate the necessity for irrigation, often there is still required a certain amount of pumping for domestic use and livestock watering which represents a substantial sales potential in itself.

As an illustration of what is generally considered "light-pumping," a butane dealer in the San Joaquin Valley of California installed a small, 35 hp. engine and a geared-head pump. The unit consumed 3.5 gal. per hour, 12 hours per day—or 1260 gal. per month.

Gas Excels Electricity

The argument that LP-Gas can't compete with electricity in irrigation pumping is not factual. The stationary gas pumping engine is rapidly replacing electric motors, even where special summer rates are made available—and on the basis of lowered fuel costs, alone.

Irrigation engineers and well drillers are only too familiar with one dangerous and expensive shortcoming of electric pumping. Electric motors attain full speed in a matter of seconds, causing a sharp surge in the well. Under surge conditions water is drawn too abruptly through perforations in the well casing, drawing sand through with it.

This results in a condition which in time requires that the sand be pumped out and the well be packed with gravel—as has been noted, an expensive proposition. Pumps have frequently been "sanded out" of operation within one season.

In contrast to this, LP-Gas pumps are started at low, idling speeds and power is applied gradually over a period from 30 minutes to one hour. It isn't unusual for a deep-well, rotary pump treated in this manner,

to last as long as six seasons, without repair.

In entering this field it is advisable for the dealer to become acquainted with the well drillers in the area. They know much about pumps, wells and power equipment and are familiar with gas engine superiority.

Irrigation pumping is a field that requires a good deal of knowledge on specific procedures for use in the measurement of water, the amount of power required to lift water from varying levels, and various pump efficiency and horsepower losses through friction.

Technical information covering these subjects is available to the dealer. It will simplify the matter of calculating engine and pump requirements and enable the dealer to make reliable, well founded sales approaches.

Pacific Refiners Open Branch in Wailuku, Maui

Pacific Refiners, Ltd., of Honolulu, opened a branch in Wailuku, Maui, April 14, according to R. D. Craddock, sales manager and secretary of the corporation.

It is the second neighbor island branch to be opened by the company, which began production of butane and other products in 1950. A Hilo branch was opened about 10 days previously.

A large variety of the gas appliances sold by the firm will be on display. Wilma T. Lohmeyer, home service director for Honolulu Gas Co., Ltd., will conduct cooking demonstrations.

The gas appliances to be displayed have been adapted for the use of LP-Gas produced by the Pacific refinery in Kapalama.

INDUSTRIAL APPLICATIONS

INDUSTRIAL applications of liquefied petroleum gas within the average dealer's scope of operations are innumerable. Industry is a heavy consumer and dependable buyer, which insures a steady, predictable fuel load for the distributor—of a volume that may make the seasonal fluctuations of other loads less critical.

Complete dependability of installations, service, and fuel supply are the main considerations in entering this field. LP-Gas has the edge on competitors because in many cases it is not only the best but the only fuel that can do a certain job for industry.

Following is a list of outstanding applications:

Drying Operations

LP-Gas may be used for drying nearly any product.

Drying may be done in kilns, ovens, bins, on trays or racks or other types of drying equipment. It removes moisture from materials to prepare them for further processing, storage, curing, reducing weight, or otherwise improving their quality. Drying is not to be confused with dehydrating.

Lumber, farm products, refractory materials, sand, gravel, wallboard, plastics, molding sand, and numerous other materials require drying.

Ceramics

There are many jobs in the ceramic industry such as drying clays, frit burning, product firing, enamel burning, japanning, etc., which re-

quire a clean fuel and close control of furnace atmosphere and temperatures. Sulphur is detrimental in most all this work as it affects the color of the finished ware.

All types of kilns are used and LP-Gas may be applied to any of them.

Standard type gas burners or combustion systems can be used. The clean burning of LP-Gas which is free of sulphur, and easy to control, makes it an ideal fuel for the ceramic industry.

Plaster and Cement Drying

Building contractors, operating in areas subject to cold snaps or extended frigid weather, have found it profitable to maintain drying temperatures with LP-Gas heaters which require no "night supervision."

In drying cement foundations, concrete brick, masonry or other such installations, contractors have utilized portable and adjustable tents or boxes to cover given areas and into which is inducted LP-Gas heated air.

Paint Drying

Refractory type "infra-red" burners, employed with a recirculating system, as is used in paint drying, and fired with LP-Gas, offer decided advantages over other systems. As much as 60% lower fuel costs and a 30% increase in production have been obtained in paint drying.

Additional advantages include pure oven atmosphere, wide ranges of colors and finishes processed simultaneously, and temperature resetting without changing conveyor speeds. Headaches eliminated by the system

include the necessity of "reformulating paints," controlling the size and shape of work being processed, and the focusing of burners (or lamps) on painted surfaces. The Burdett Manufacturing Co., Chicago, produces special burners which employ the "infra-red principle" of paint drying. Easily controlled temperature changes are possible within a 150° to 550° range.

Kilns—Brick

After forming, building brick and tile are burned at high temperatures (1900° to 2200°) in continuous or downdraft (beehive) type kilns. The kilns may be equipped with inspirator or pre-mix type burners with the air for combustion induced by natural or mechanical draft or by a blower which furnishes all or part of the air for combustion.

Glazes used for the facing of building brick are extremely sensitive to the temperature at which they are burned and to sulphur. Variations in temperature cause variations in color results for certain glazes.

The ease of close temperature control and the freedom from sulphur which is provided by LP-Gas make it an ideal fuel for this type of work.

Logging

Some of the most rugged tests butane and propane have faced are now routine work in large-scale logging operations. LP-Gas powers tractors and bulldozers in heavily forested areas of this country and Canada, snaking out logs, clearing skid rows and truck trails, and pulling logs from mill ponds.

Heavy duty, converted trucks haul logs to railroads and mills.

Sawmills

Sawmills need power for operation, and internal combustion engines using LP-Gas for fuel make a labor-saving, economical operating unit for them. Also, many sawmills dry part of the lumber they produce in kilns.

The modern lumber kiln is operated by circulating air at controlled temperature and humidity through it.

LP-Gas is used in sawmills like this one for lumber drying, power applications, and domestic services.





Ampie, flexible power is needed in logging operations and LP-Gas furnishes it for trucks and tractor bulldozers.

Part of the air is recirculated and part discharged from the kiln. The make-up air is supplied through a gas-fired air heater, thermostatically controlled, and mixed with the recirculated air to bring it back up to temperature.

LP-Gas is ideal as the fuel for this work.

Heat Treating

Heat-treating is a term applied to the treating of metals, ceramics, plastics, and other materials in which certain qualities of the products are improved. Furnaces, ovens, baths, and direct-flame impingement are used for heat-treating processes.

LP-Gas is applicable to most heat-treating processes and has many desirable qualities such as uniform heat value, cleanliness, little or no sulphur content, ease of furnace atmosphere, and temperature control, which make it a desirable fuel.

Annealing

Annealing is the heat treatment of metals, plastics, glass and many other materials to relieve stresses, clean surfaces, and perform certain

other operations which improve the quality of the product.

Annealing is accomplished in a variety of furnaces, ovens, baths and even under direct-flame impingement in some special continuous operations. Bright annealing of steel, copper, and certain other materials is often done in special prepared atmospheres developed by the partial combustion of gaseous fuels. The burners developed for use on these various types of furnaces, ovens, etc., are applicable with LP-Gas.

LP-Gas can be applied for any annealing operation to which other fuels are applicable, either as the source of heat or in preparing the atmosphere. Its freedom from sulphur, its cleanliness, uniformity in heating value, and ease of application and control make it a desirable fuel.

Brazing

Brazing is often thought of as a job done with brazing rod and torch, but this is only a small part of such work. Development of the free-flowing, low-melting point, silver brazing alloys has greatly widened the uses

and applications of hard soldering.

Much of this brazing or hard-soldering work is done in batch-type oven furnaces, continuous furnaces, and salt baths, and requires uniform application of heat within close limits of temperature. Often furnace atmospheres are important. A gaseous fuel is best for meeting these conditions and LP-Gas is one of the most uniform gases in heat content and quality.

Carburizing

Gas carburizing steel consists of raising the carbon content at the surface of a piece of low carbon steel. The surface or portion of the surface which is to be carburized is exposed at high temperatures to gases composed primarily of CO and CO₂ which raise the carbon content of the steel

near the surface to depths of from .010 in. to .125 in. as required.

Gas carburizing is done in special muffle furnaces in which the material being carburized is surrounded by the prepared atmosphere and heated. In pack carburizing, the parts are placed in a box with some carbonaceous material such as charcoal, charred leather, sugar, lampblack, or similar materials. The box, tightly closed, is then placed in the furnace and heated.

Close control of the temperature and the gas atmosphere are necessary for accurate results. LP-Gas provides a fuel by which both can be easily accomplished.

Cutting

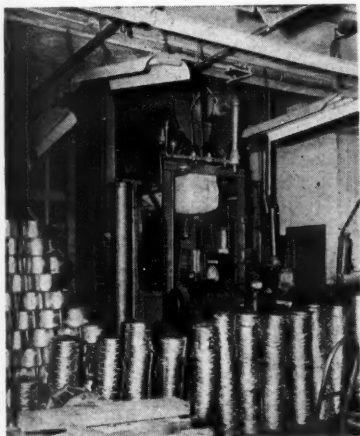
Cutting steel with propane-oxygen torches has proven more satisfactory in many cases than with acetylene and oxygen. Standard flame cutting equipment, except that the torch tips are designed for propane, is used.

Propane-oxygen cuts are extremely clean and permit holding close tolerances. Cuts through single plates or stacked plates up to 12 in. are not uncommon and the accuracy of dimensions is excellent for the entire thickness.

Propane is preferred where cleanliness and accuracy of the cut are of first importance. Preheating and starting the cut are slower with propane than with acetylene but speed of cutting after the start is about the same.

Flame Hardening

Flame hardening or case hardening consists of heating the surface only of any steel piece and then quickly quenching to harden it. This produces a hard surface resistant to wear, backed up by a soft center which will withstand shock. Flame hardening of small, uniformly shaped pieces may be done on automatic



Panel board view of 1000°F propane-fired heat treatment furnace at Eastern Metal Products Co., Tuckahoe, N. Y. Furnace is capable of treating 5000 lbs. of aluminum in one trip.

machines designed to handle many hundred per hour. Close control of the flame and accurate timing produces a consistently uniform product. Often large gear teeth can be hardened by heating the surface and quenching with air or water to improve the wearing qualities.

The oxy-propane flame produces very fast heating without danger of violent backfire which sometimes occurs in the case of oxy-acetylene. The steel to be treated should generally not exceed 1600°F and since the oxygen-gas flame can easily reach double this value, a stoppage in the feed mechanism would cause the work to be melted in a few seconds' time.

In flame hardening heavier sections, the temperature rise of the interior of the part will lag behind that on the surface, depending on the heat conductivity of the material. Thus, there is danger of overheating the surface, and the use of lower temperature flames such as propane-air is recommended. High-pressure propane burners using air at atmospheric pressure are economical to set up and produce a safe maximum of approximately 1700° F. It is difficult to confine these flames in small areas, however, and they are recommended only where the work is very small and fuel economy is no problem.

Forges

Forges or forge furnaces are furnaces used to heat metals to forging temperature for shaping, either manually, as the old-time blacksmith, or under modern forge presses which may shape small parts, automobile crankshafts, or huge pieces like large gun barrels. The equipment used ranges from a small table forge furnace which may be 6x8x10 in. inside to large units 10x10x50 ft. long, or larger.

LP-Gas may be applied to any operation using this type of furnace,

either as the primary fuel or as a standby fuel in case the utility cannot supply service during periods of emergency.

Metallizing

A process of melting and depositing any metal which may be obtained in wire form on virtually any base material, metallizing, is a sizeable industrial market for liquefied petroleum gases. Compressed air, oxygen, propane and metal wire are required by the metallizing gun.

Compressed air operates a small turbine which provides the power to feed metal wire through the unit. An oxygen-propane flame melts wire at the nozzle of the gun, compressed air atomizes the molten wire and sprays it on the base material.

Acetylene or hydrogen were formerly used in the process, but propane now handles the job at considerably lower cost.

Metal Melting

Melting and alloying the lower melting point metals (400° to 1500° F) require accurate control of temperatures for the efficient production of quality product, especially when the metal is cast into intricate shapes.

LP-Gas is a good fuel with which to obtain the best results, and also provides longer life of crucibles and melting furnaces because the heat can be applied uniformly to the furnace walls and crucibles without localized flame impingement.

Soldering

Soldering with soft solder or the higher melting point silver solders may be done with propane torches which inspire their own air. A large assortment of heads is available for spreading the flame over the ware for most satisfactory heating.

This heating unit sells more living room



A truly great space saver like the Bryant *Hide-away* Forced-Air Furnace helps sell the idea of home heating with LP-Gas. It can be tucked away in the attic or suspended from ceiling or under the floor, releasing for storage, utility or *living* all the valuable space usually occupied by conventional heating equipment!

The *Hide-away* offers typical Bryant dependability and gas economy, with positive automatic control. Casing temperatures are *low*. Installation-wise, you get ease of handling, and structural steel mounting channels provided can also be used to suspend the unit when it is so installed.

Sell more *living* space and better *heating* at the same time with the Bryant *Hide-away* Forced-Air Furnace! For complete details, contact the Bryant Distributor nearest you or write direct. Bryant Heater Division, Dept. 245, Affiliated Gas Equipment, Inc., 17825 St. Clair Avenue, Cleveland 10, Ohio.



Bryant Model 324 LP-Gas Forced-Air Furnace, with Hevigage 12-gauge steel heat exchanger. A.G.A. inputs: 65, 85, 100 and 125 thousand Btu per hour.



Your single source of supply for everything in gas heating equipment!

Railroad Uses

INCREASED demands for LP-Gas and equipment by the railroads is rapidly creating a large market in which the local dealer can profitably share. That demand has been encouraged strictly through providing a fuel that can do a given job better than its competitors. In some cases the LP-Gas industry has developed the only equipment that can do a vital job for the railroads.

Air Conditioning

Progressive railroads are swinging toward LP-Gas to handle their cooking, refrigerating and air conditioning loads. Air conditioning equipment weighing but 1600 lbs. duplicates the job done by 10,000 lbs. of deadweight ice in a bunker. A single 100-lb. cylinder of propane produces the same amount of cooled air as the 5-ton bunker, takes less time to load, requires less space for six bottles than for one load of ice, thereby eliminating frequent loading-up stops and the problem of obtaining ice in the wide-open spaces.

Powered by a 4-cylinder, propane engine, the refrigerant compressor makes no demands on horsepower at the wheel as do electric-powered units (sometimes as high as 20 hp. per compressor). By the same fact, it requires no batteries for operation when the car is stopped.

Food refrigerating and cooking with LP-Gas also eliminate the drain electrical equipment puts upon the motive power of trains. These three loads are estimated to provide a potential of 30,000,000 lbs. of LP-Gas.

Water Storage Heater

Side-arm water heaters and "hot flue" heaters have been successfully applied to the job of heating railroad

water storage tanks subject to freeze-ups.

Hot stack models employ simple, draft-proof burners which are directed into a vent rising vertically through floor and roof of the storage tank. The stack prevents ice from forming at the surface of the water, thus providing a breather hole for efficient withdrawal of water. The stack outlet requires protection against back drafts.

The side-arm water heater installation is thermostatically controlled, as is the hot flue unit, and is set to fire up at 34° F. Circulation is obtained by directing water supply lines to a large, vertical pipe which extends above the surface of the water and which is open at both ends.

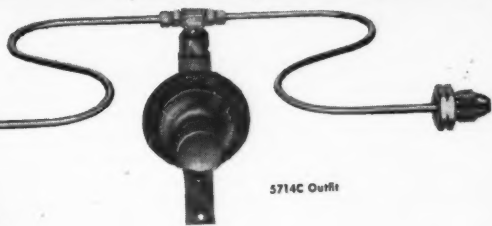
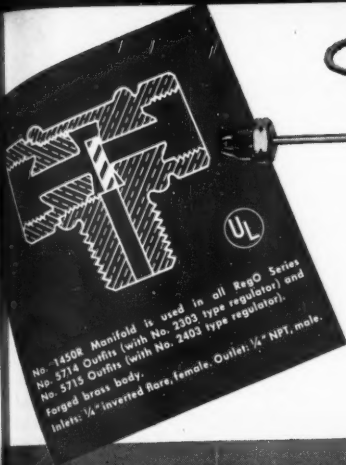
Both installations require automatic shutoff controls and full sheathing of the water storage tank and supports.

Rail Ends, Build-up

Another job that was economically infeasible until LP-Gas entered the picture was the building up of rail ends. Constant hammering by train tires wears a depression in rails just beyond the joint. If the condition is not corrected the depression lengthens and more appear further along



Cylinder installation on Southern Pacific Railroad.



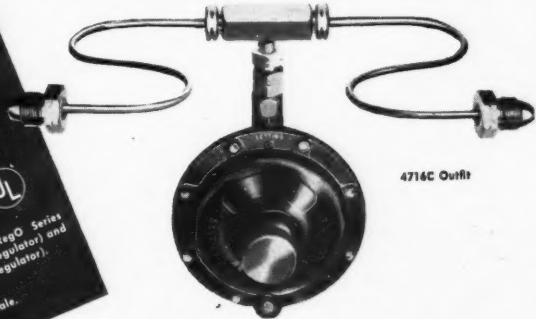
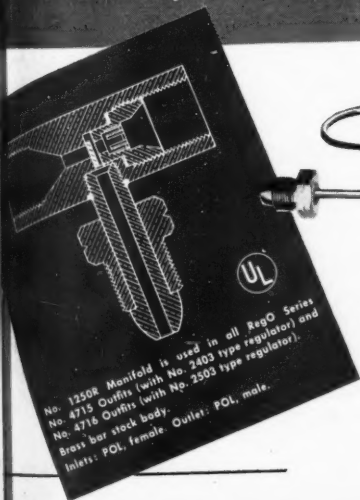
5714C Outfit

RegO Outfits for Portable Cylinder Systems which incorporate a Check-Valve Manifold are low in cost and high in dependability.

A check-valve type manifold permits replacement of the empty cylinder in a system without disrupting service to the appliances. The full cylinder does not have to be shut off, as the check-valve in the manifold prevents excessive

leakage of gas while the empty cylinder is being disconnected and replaced with a full one.

Each Outfit consists of:
Check-Valve Manifold (type as selected)
Low Pressure Regulator (three sizes available)
Flexible Copper Pigtails (straight, loop or S bend)



4716C Outfit

the rail, where wheels have rebounded.

Building up rail ends with weld and then grinding to precision smoothness with a special machine was theoretically possible—but the cost of acetylene for rail heating and welding was prohibitive. In addition, it was discovered that the temper and tensile strength of rails were altered and the bond between cold rail and hot weld was often poor. The rails simply absorbed too much heat for practical welding.

A propane-fired pre-heater and post-heater was developed by Teleweld, Inc., of Chicago. Electric welding added the final touch and a large new business sprang into existence. It is estimated that well over four million pounds of propane are now consumed by Teleweld and other concerns in this field.

Dealers should contact divisional headquarters of the rail line in their area in order to supply fuel for repair crews.

Switch Heater

Phillips Petroleum Co. has developed a switch heater which fits into the latter category. Where steam pipes and electric heating units break down under the vibration of passing trains the LP-Gas-fired switch heater continues to operate, week in and week out.

A special burner of simple design and rugged construction, the heater obtains fuel through a small orifice, picking up enough air to make a completely combustible mixture. All combustion takes place in the burner tube and the hot products are vented through slots in the tube's upper surface. These come in contact with the burner canopy which, in turn, is in contact with the rails.

High efficiency is obtained with the heaters which are generally placed

eight to a switch and four to each rail. The units are fed from one "service" and one "reserve" bottle of 100-lb. capacity. Several railroads have these heaters in operation at key points, but the field is still open to the local dealer. It is to the interest of the railroads to make purchases where there is assurance of absolutely dependable service. An empty fuel tank can mean a frozen switch, a wrecked train and the loss of hundreds of lives.

A demonstrating installation will probably be required by the railroad with which the local distributor deals. Caution: The manufacturer's directions should be followed explicitly in all phases of installation. Thousands of hours of research have gone into the development of LP-Gas-fired switch heaters and their installation.

Switch Engines, Maintenance

LP-Gas is also gaining wide acceptance as an ideal fuel for switching engines because of its greater responsiveness and lower cost in low speed operations—as compared to electricity and oil.

This load, combined with the potential maintenance requirements (paint removal and tire shrinking) adds up to 132,000,000 gals. of LP-Gas per year.

Welding

LP-Gas can be used satisfactorily on certain of the lower melting point metals which can be welded without the use of special atmospheres to prevent oxidation.

It does not lend itself well, however, to gas-welding of steel because it does not produce a sufficiently intense and localized heat to melt the steel for good penetration and rapid work.

Miscellaneous

Boat Power and Refrigeration

Riverboats, tugs, ferries and sea-going craft are rapidly converting to LP-Gas for both power and refrigeration. In most cases commercial "absorption type" refrigerators have been installed for uninterrupted service both at sea and at dock.

One fishing boat, converted to crawfish and lobster fishing, ran its high-pressure fuel supply line through refrigerating compartment in coils to eliminate the use of ice and maintained an average temperature low of 54. From a storage compartment it was fed to a low pressure regulator and on to the engines.

Dehumidification

LP-Gas is used beyond the mains to dehumidify and dehydrate foods and candies. Gas is applied to heat and dry silica gel filters which have removed certain amounts of humidity from the air in many candy plants as an aid to production and storage.

In the dehydration of food, many concerns use propane combustion gases in direct contact with the product. In all phases of dehumidifying and dehydrating processes, consumers agree that LP-Gas does its specialized job with greater flexibility, economy and efficiency than any of its competitors.

Field Stoves

Originally developed for use by the U.S. Forest Service, subsequently adopted by the Army and Navy, and later put into production for civilian use, is the LP-Gas field stove. The unit, produced by the Ransome Co., Emeryville, Calif., is easily assembled from its packed size which requires but 17 cu. ft. of space.

The complete field stove consists of three burner sections with five burners each, 1-can water heater and an oven with four burners. It may be assembled in whole or in part and has found wide use with ranch mobile kitchens, the armed forces, forestry units and disaster corps.

Glass Manufacturing

LP-Gas is used to melt the sands used in glass manufacturing, an operation that demands a constant temperature of 2800° F. The fuel has been utilized exclusively in some cases and in others alternating with natural gas.

In the latter case, air-mix systems are used to bring the Btu content of LP-Gas down to that of natural gas. In the "exclusive fuel" application the standard LP-Gas installation is used.

Greenhouse Heating

LP-Gas and appliances are in demand by nurserymen and florists. Specialized greenhouse heaters are now being produced although vented and unvented space heaters are also adaptable to the job.

One nurseryman reported that he heated more than 8000 sq. ft. of space at a cost of \$80 per month—during the coldest month of the year in Kansas.

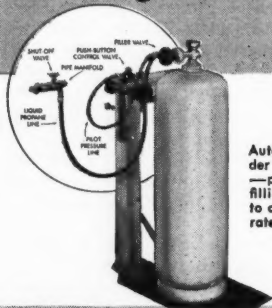
Vital selling points are safety, economy and dependable, constant heat, thermostatically controlled, and the beneficial effect upon most plant life of the products of combustion when heating with butane or propane.

Lead Heater

The plumbing industry applies LP-Gas and equipment for heating lead pots. In addition, blow torches for general industrial use are manufactured by several concerns and

WEATHERHEAD SERVES

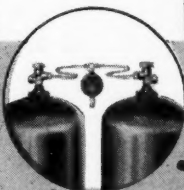
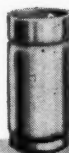
**FOR
CYLINDER
SYSTEMS**



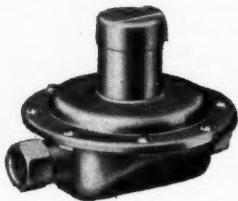
Automatic Cylinder Filling Unit
—prevents over-filling — simple to operate, accurate and safe.

Weatherhead **Rated** Regulators made in sizes 2½", 3½", 5" and 6" for accurate regulation to the uniform pressures required by appliances. The small 2½" regulator provides up to twice the capacity needed for three appliances.

Cylinders — 100 lb., 60 lb., and 20-lb. capacities—drawn from lightweight, high tensile alloy steel at a single stroke for rugged strength.



One-Package Assembly Units mean service convenience...30001 (Automatic) and 30019 (Tee Check) installation units.



3 REASONS WHY WEATHERHEAD can help you build your LP-Gas Business

1. NEARBY WAREHOUSES

In addition to our Cleveland Plant, Weatherhead has seven completely stocked warehouses strategically located for prompt service to distributors and dealers. Warehouses — ready to serve you — are located in Albany, N. Y., Atlanta, Ga., Dallas, Tex., Kansas City, Mo., Lambertville, N. J., Minneapolis, Minn. and Orlando, Fla.

2. WEATHERHEAD RESEARCH AND DEVELOPMENT

Field tests, laboratory tests, constant research and development have contributed to the accuracy and dependability of all Weatherhead equipment . . . designed, built and guaranteed to provide lasting service and exact performance.

3. MANUFACTURING EXPERIENCE

Meeting the rigid standards of the LP-Gas industry makes quality a Weatherhead habit. Good craftsmanship comes only through experience and the right kind of tools. At Weatherhead the most modern methods and tools available are combined with the experience gained through more than 30 years of serving the Aviation, Refrigeration, Automotive and other key industries.

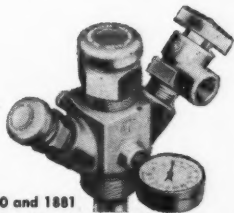
...with a complete line of LP-Gas Equipment

FOR TANK SYSTEMS

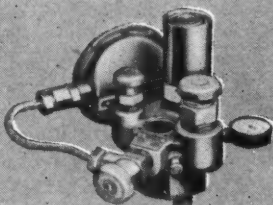
Only Weatherhead gives you the malleable iron multiple-tank head—result of constant research and the Weatherhead Product Testing Program. Malleable iron tank heads stand the guff . . . you can mount and ship them, sell them with complete assurance of the one quality most important in tank performance — dependability.

All Weatherhead fittings are standard catalog items—replacement can be made without the expense of an entire new assembly.

You can get liquid withdrawal on all Weatherhead Malleable Iron Heads for truck and tractor fueling . . .



Series 1800 and 1881
Shockproof Malleable Iron Heads



House Line Valves—designed especially for systems where separate relief valves are used.



Fill-in Valves—easy, positive action for fast filling; long service life.



Vapor Pressure Gauges—for dependably accurate measurement of gas pressures.



Fixed Liquid Level Gauges—(left) indicate maximum permitted filling level.

Vapor Equalizer Valves—(above, right) wide variety of flows and pipe-thread sizes to meet every possible need.

Relief Valves—precision built for accuracy and safety.



Write

FOR NEW CATALOG

Get attractive, completely illustrated Weatherhead catalog. Address—

The Weatherhead Company, Dept. G-1, 300 East 131st St., Cleveland 8, Ohio.



**Engineering ability
means product
dependability**



have become popular with plumbers.

One of the latter units is available with adapters which convert it to a "light-duty" pot heater, complete with grill.

Mining Operations

The portability of bottled LP-Gas and its characteristic of reducing engine wear has made it popular with mining interests located far from sources of fuel and replacement parts for their equipment.

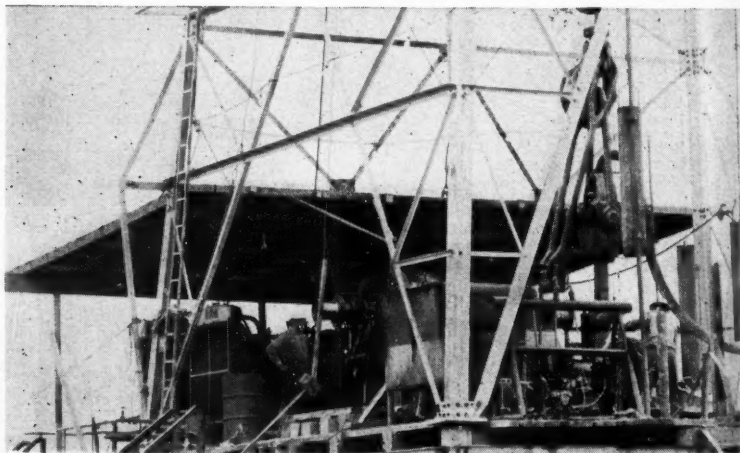
Principally utilized in power applications (compressors, pumps, trucks and rail cars), LP-Gas has also found services to perform in some phases of processing. And, of course, for heating, cooking, water heating and refrigeration.

Newspaper and Printing Plants

Fuel-oil-fired pots used for melting lead on typesetting machines, for re-

melting purposes in the stereotype room, and in engraving are easy prey to LP-Gas conversion. Butane and propane systems are eliminating the necessity of turning off fuel-oil burners at night, manual control of temperatures, and long heat-up periods in the morning. Substantial savings in fuel costs and man hours are routine for the more efficient and flexible fuel.

In its competition with electrically heated printing equipment, gas has the edge for the following reasons: (1) It does not have to be shut down at night because of high fuel costs; (2) For the same reason lead doesn't require a "melting down" period when printing operations resume; (3) There are no electrical elements to burn out and shut down productive equipment, thus maintenance costs are reduced; (4) There are no power failures with gas. Improved quality



Texas wildcat oil drilling rig operated by diesel engines converted to burn butane.

The Same "Silent Passenger" Rides in Each Vehicle



In every shipment of SINCLAIR LP-GASES a very important "silent passenger" rides. He is called Hidden Ingredient—and is made up of such things as INTEGRITY, REPUTATION, RESPONSIBILITY, PERFORMANCE, and REAL SERVICE.

That is why consumers call for Sinclair LP-Gases. They know they get products of the highest heating value, expertly refined, with all moisture and impurities removed.

SINCLAIR

A Great Name in Oil

SINCLAIR OIL & GAS COMPANY

LIQUEFIED PETROLEUM GAS DIVISION • SINCLAIR BUILDING, TULSA, OKLA.

in engravings through better sensitization of metal plates is another characteristic of LP-Gas in this field.

Oil Drilling

As high an average as 50% of the companies engaged in drilling operations in certain oil fields now use LP-Gas as the fuel for both drilling operations and auxiliary power. The average "wildcat" company employs three 350-h.p. engines to drive drills, water pumps and rigging. Two more 225-h.p. engines handle additional pumps and another pair power light plants for night work.

Fuel supply installations are temporary in design and are generally put in on a lease basis.

Produce Truck Heaters

Heaters specially designed to maintain favorable temperatures in trucks carrying agricultural produce to market through frigid weather are coming into increased demand by fleet operators.

One such unit, developed by Utilities Distributors, Inc., Portland, Maine, has a maximum burner output of 20,000 Btu per hour and requires but 1 sq. ft. of space with the "load guide" guard rail. The load guide feature protects the heater, prevents load shifts and provides a space for recirculation of air.

Incorporating thermostatic control and pilot burner, the heater will operate continuously for 40 hours although, under favorable conditions, cargo protection has been provided for nearly 120 hours. Two 20-lb. bottles, mounted in a sturdy carrier beneath the truck bed, serve as fuel supply.

Rainmaking

Researchers have developed and tested portable, ground based rain-making units utilizing propane as an

oxidizing fuel. Early charcoal-fueled models are not believed as efficient as LP-Gas. Propane is reported to oxidize 98% of the silver iodide crystals (an expensive reagent) and to be dependable in operation under all weather conditions.

The possible proving of rainmaking theory, in the field, may result in a new source of business for LP-Gas dealers. Units for installation in aircraft have also been developed.

Rocket Fuel

This application is by no means a commonplace "load," but LP-Gas has been used extensively as one of the fuels in scientific experimentation with, and development of, liquid fueled rockets. Although the term "liquid fueled" is not absolutely correct as the gas industry uses it, it is aeronautical terminology which serves to designate the two general types of fuel—liquid and solid.

Propane is of value because of its self-pressuring characteristics and the fact that it burns violently when it comes in contact with many of the high-powered oxidizing agents.

Tire Retreading

The steam required for pressurizing and heating tire and tread in recapping molds can best be generated by LP-Gas-fired boilers. The average boiler employed by community recapping shops generates from 1 to 10 hp. and has a very slight differential between operating pressure and relief valve pop-off.

LP-Gas can more than compete with coal and oil as a firing fuel on a cost basis, alone. In addition it offers the advantages of accurate thermostatic control (minimizing safety valve pop-off); saves valuable fuel storage space; is fully automatic, saving valuable man hours in pres-

**Better-than-ever Design
for
Bigger-than-ever Profits!**



Butler 1200 gallon
LP-Gas Truck Tank

*Advanced
Design*



LP-GAS TRUCK TANKS

Now better-than-ever *Advanced Design* Butler LP-Gas Truck Tanks assure you bigger-than-ever profits. Why? Because every new *Advanced Design* feature brings more efficiency with less upkeep expense. More compact controls mean greater operating efficiency . . . better-than-ever pump by-pass valve gives more protection against leakage . . . more accessible line strainer allows easier servicing . . . entire meter assembly can now be quickly removed for easy inspection or maintenance.

For all your delivery needs . . . Butler LP-Gas Truck Tanks with *Advanced Design* are your best long-term investment.

BUTLER MANUFACTURING COMPANY

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For additional
information
write office
nearest you:



BUTLER MANUFACTURING COMPANY
7410 E. 13th St., Kansas City 3E, Mo.
910 6th Ave., S.E., Minneapolis 14, Minn.
Dept. BP56, Richmond, Calif.

sure checks and control changes; eliminates the necessity of expensive chimney, and lowers maintenance costs.

Tar Pots

Propane and butane-fueled tar pots have proved their superiority over old-fashioned charcoal units. They are more portable, dependable, compact and convenient. In addition, they do not require large storage areas for charcoal supply. Construction crews and home builders report substantial savings in time and labor.

LP-Gas has also been profitably applied in heavy-duty, tar and asphalt wagons for building operations and road construction.

Transporting Livestock

LP-Gas offers an ideal fuel for trucks transporting livestock from farm to market. If diesel-powered trucks and trailers are used, the animals frequently breathe too much of the heavy exhaust fumes, causing them to sicken and lose their appetites. This results in loss of weight, which is a direct loss to the owner. It sometimes requires several days in

the feed lot to restore the weight. In either case, the loss is costly.

The oily diesel exhaust gases also cover the animals with a black coating that has to be cleaned from their hides and that causes them to make poor appearances in sales markets.

The clean burning characteristics of the LP-Gas engine eliminate the cause of this loss.

Transportation, Construction Equipment

The heavy transportation equipment used in highway construction and maintenance, building of dams and levees, open pit mining, etc., makes ideal conversions to LP-Gas. These enormous engines consume so much fuel that the savings from LP-Gas frequently offset the conversion cost in weeks—not months or years.

Operators appreciate the low cost fuel and reduction of engine repair cost, but most of all they like the lessened down-time on account of the less frequent need for engine repairs. Those days saved for productive use add to the earning power of the equipment.

Carrying equipment, powered by LP-Gas, being loaded by shovels at the Garrison dam project in South Dakota.



A TWIN BARREL TRUCK TANK *that makes* *your service* **EVEREADY**

Two features of this truck tank make it one of our most popular models:

1. ALL FITTINGS COUNTER SUNK.
2. BUILT-IN TOOL BOXES ON BOTH SIDES.



MODEL 202

(twin barrel truck tank)

Write or call us
for quotations.

TRINITY STEEL COMPANY INC.
EVEREADY
WATER SYSTEMS
C. J. BENDER

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TEL. HUinter 8321

DALLAS, TEXAS

FARM APPLICATIONS

BUTANE and propane have found application in every department of the dairy field. From the time the cow leaves the barn until the milk is loaded on the delivery truck, gas has found a way to do every job better, faster and more economically than its competitors.

The many services gas is performing every day, in hundreds of dairy farms, are noted briefly below. Descriptions of the applications of liquefied petroleum in livestock operations are also given.

Dairying, Ranching

Refrigerating equipment handles one or both of two major jobs with equal efficiency when fired or powered by LP-Gas. These jobs are cooling milk before and after pasteurization and producing ice for the shipment of the product.

Compressor units fueled by liquefied petroleum gas operate at a cost far below that of electricity. Absorption-type gas refrigerating equipment operates with far greater efficiency and cleanliness when fired with gas than it does with fuel oil.

Sterilizers, Steam Cabinets

LP-Gas is successfully used to fire milk sterilizers or "quick-steam" cabinets for dairy equipment on many farms. Where cleanliness is a major factor, as it is in sterilization, gas provides an unparalleled service and produces steam in what seems an amazingly short time to former users of competitive fuels.

Heavy duty boiler systems, produc-

ing both hot water and steam are far more efficiently fired by gas than by any other fuel. Electric power bows to price competition; coal and oil can't compete against LP-Gas' cleanliness, low maintenance cost and dependability.

Stock Tank Heaters

Stock tank heaters, fueled by LP-Gas, have been developed for the farmer which far surpass the old wood and liquid fuel burners. Scientific design has brought the gas heaters to a new peak of efficiency although they operate under unfavorable conditions such as heat transfer losses and intake-exhaust stack drafts. Eliminated in LP-Gas fired installations are soot and oil films on the water, fire hazard, and burner failures. Wooden stock tank covers are recommended for use at night to keep heat losses to a minimum. Air intake and vent stacks should be protected from the cattle by screened framework.

Molasses Thinning

The cattlemen's problem of thinning molasses to a consistency which may be sprayed on "fattening feed" has been licked by an LP-Gas-fired water tank.

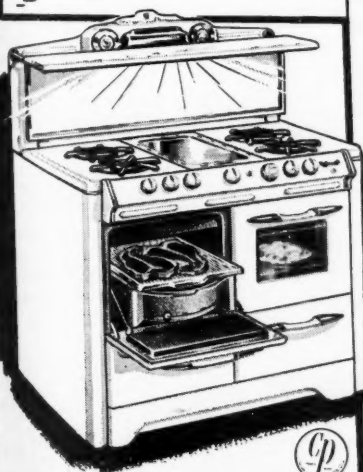
Hot water from the heating tank circulates by gravity through piping installed in a 280-gal. molasses tank. A 40,000-Btu burner equipped with a thermostat keeps the water at 140°. A 50-gal. supply tank keeps the unit in operation 24 hours per day. Mounted on a flat-bed, rubber-tired trailer.

Your Customer Looks For This Nameplate!

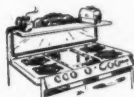


When a woman chooses a new gas range she naturally wants extra value, automatic conveniences, advantages that will help her be a better cook with less work. In short—she's looking

for an O'Keefe & Merritt! It will pay you to be able to supply her with this finer gas range; write today for complete information on new models now ready for your showroom.



Only O'Keefe & Merritt
has these Most-Wanted features



Vanishing Shelf-Cover—

Both a stepsaving shelf and a smart cover—in one patented feature!

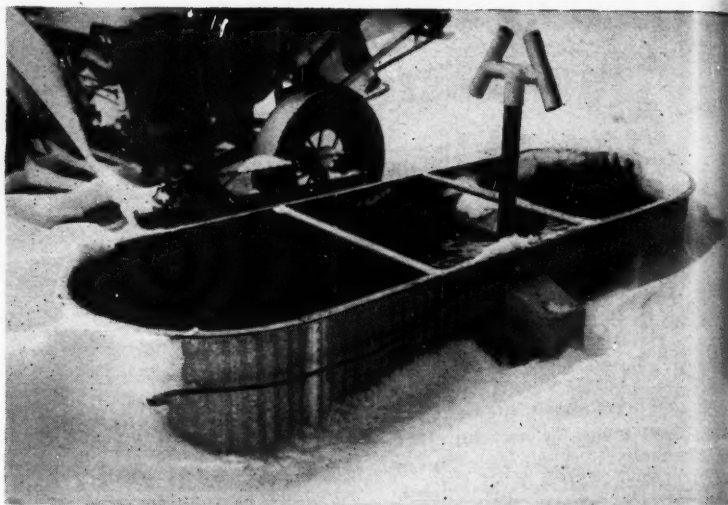


Grilleator Broiler
—Instant, fingertip choice of broiling levels!



Kool Kontrol Panel—
Conveniently slanted knobs never get hot.

O'KEEFE & MERRITT CO. 3700 E. OLYMPIC BLVD., LOS ANGELES 23, CALIF.



This Johnson Gas Appliance Co. stock tank heater removes winter drinking hazards for cattle and hogs.

the mobile unit may be moved from place to place.

When thinned to about the consistency of No. 10 SAE oil, the molasses is pumped out of the tank by a 20-inch pump, powered by a 6 hp. reciprocating engine. It is then sprayed on the feed through a 15-ft. hose.

Branding Torches

LP-Gas torches are replacing the traditional branding iron—and are now keeping shock, loss of appetite, loss of weight, infection and screw-worm to a minimum in cattle thus branded.

Developed by the Ransome Co., Emeryville, Calif., in cooperation with cattlemen, the new torch incorporates a cast bronze head which is tough enough to stand rough treatment and is an excellent conductor of

heat. It does not tend to oxidize, scale, or peel off as did the old steel branding iron. Therefore, stockmen now prefer 3/16-in.-wide branding characters instead of the old 1/4-in.-width necessary with oxidizing iron.

It is designed so that a small burner plays upon the back of the bronze head. Heat input may be controlled to obtain good, clear brands. The torch may be obtained in three models, chute, holster, and compact unit type, from Western Craftsmen, 772 Bryant St., San Francisco. Eliminated are the old problems of clogging and fouling, priming and pumping, waiting for heating and the hazard of open fires in brush and timber.

Feed Grinder—Portable

Grinding of fodder and grain for stock feed improves their feeding

UNIFORM
Forged
body of
expans
severe

BU
More th
tests ar
entee u

AMPL
New i
type s
ample
above

EXTRA
Cylindr
full thre

Q

JUNE -

An extra measure of safety . . . that PAYS!

FORGED

KEROTEST

BRASS

LP-CYLINDER VALVES

UNIFORMITY OF MATERIAL

Forged bonnet nut and forged body assure uniformity against expansion and contraction in severe weather.

BUILT FOR SAFETY

More than double the usual tests and inspections to guarantee unfailing safety.

AMPLE SAFETY RELIEF

New improved "pop" type safety assures an ample relief capacity above your requirements.

EXTRA LONG INLET CONNECTION

Cylinder connection supplied with 14 full threads assuring longer valve use.

ALL METAL PACKLESS CONSTRUCTION

The original Kerotest patented non-perforated all metal diaphragm packless construction with back seating feature unequalled for quality of performance and long life.

UNSURPASSED FILLING CAPACITY

TYPES

C 35A—Standard

C 35S—with 1/4" fuse plug

C 35K—with liquid level gauge

APPROVED

These valves are approved by Underwriters' Laboratories, Inc. and Bureau of Explosives for 100 and 150 lb. cylinders.

KEROTEST

MANUFACTURING CO.

2525 Liberty Ave., Pittsburgh 22, Pa.

value and reduces waste. Many farmers who would like to use ground feed do not operate on a large enough scale to justify investment in their own grinding machinery. Transportation of feed from their farms to a mill and back is too expensive in both time and money.

There is now available a portable feed grinding mill, with or without a molasses impregnator. It is permanently mounted on a 4-wheel drive Jeep so it can be taken to the feed at any location. The hammermill and molasses pump are driven by the Jeep engine through a power take-off. LP-Gas provides the power.

Capacity of the mill ranges from 1 to 4 tons per hour on grain, and from 1 to 3 tons per hour on fodder, depending on fineness of grind.

Farmers owning such a mill may make a good spare-time income grinding for their neighbors, or custom-grinding can be a full-time job.

Floor Heating

Heating the floors of harrowing houses and the air just above them with steam or hot water pipes encased in the cement is considered an economical practice by farmers—when the building is well insulated against heat loss. Floor heating warms only the area adjacent to the floor and farmers state that under certain conditions it is unnecessary to

heat the remainder of the air in a room.

In addition, this system puts the heat where the pigs need it most—in the floor. LP-Gas heaters and furnaces are the most economical in operation and most sensitive to temperature control.

Singeing

Hog singeing with natural gas, one of the steps in dressing meat for smoking and packing, is now supplemented by LP-Gas hand torches for applying finishing touches. Natural gas stationary singers do not remove all the hair from the hog as it passes on conveyors.

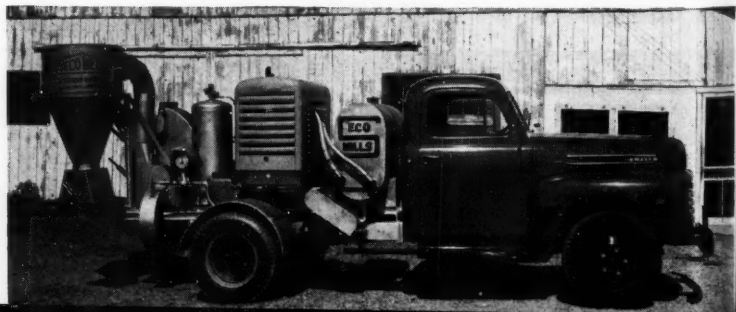
Adept personnel remove any remaining hair with portable hand torches, fed by 200-lb. bottles through flexible supply lines. As many as 200 hogs are processed in one hour.

Meat Smoking

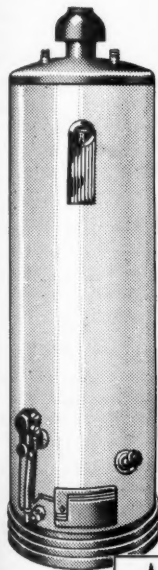
Utilized in boiler installations and smokehouses, LP-Gas has increased meat packing companies' production as much as 40% and has reduced operating costs as much as one third below other fuels. Incomplete combustion characteristics of competitive fuels are rapidly eliminating them from this industry.

Packers have also discovered that LP-Gas will serve their smokehouses as economically as wood but offers

A 2-unit Southern Equipment Co. hammermill mounted on a Ford truck, with gas tank next to the engine.



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IN THE RHEEM
RELIABLE
DEALER
PROGRAM IS
PLANNED
TO **STEP UP**
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INCOME!



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Every time you increase your unit sale, you increase your profit.

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. . . UP to the higher unit sale that's your best bet for higher profit TODAY!



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the added advantages of sensitive thermostatic control, eliminating labor costs through automatic operation.

Often processing ham, bacon and sausage on a round-the-clock basis, packers no longer face the risks of temperature changes and fuel failures. LP-Gas generates heat and forces oak or hickory sawdust shavings to smoulder in smoking processes.

Orchard Heating

Orchard heating with new-type LP-Gas-fired units employs the two essentials of efficient frost protection—the supply of an adequate amount of heated air plus radiation to overcome the freezing effect of cold atmosphere.

Both are accomplished by a heater developed and marketed by the American Liquid Gas Corp., of Los Angeles. The higher efficiency of the heater, as compared to conventional oil-fueled models, is due to certain features of design and control.

Combustion tube blast is directed vertically downward, minimizing the loss of heated air into upper regions in artificially created thermals, as is the case with most oil heaters. Flames play on a rock and pebble "bed" which absorb the heat and radiate infra-red rays, which play a vital role in the heating process.

No fuel is wasted to produce pressure as in oil heater "generators," no cleaning of equipment or burners is necessary and there is no smudge or smoke involved in LP-Gas combustion.

Since the heaters are fed through pipelines, fuel consumption may be manually controlled from a central point as atmospheric temperature fluctuates. This advantage, plus the fact that the heaters may be ignited from pilots, represents a tremendous



Lately developed orchard heater.

saving in labor. It is possible to conserve fuel under varying temperatures in contrast to oil heaters which generally operate full blast once pressure has been generated. Most of the latter cannot be controlled with precision.

Butane-propane heaters are regulated to burn from 1/16 to 3/4 gal. of fuel per hour. Maximum output is slightly over 75,000 Btu per hour. Flexibility of control is said to bring fuel costs slightly under that of oil. Savings in labor are said to amortize the cost of installation within two years.

Poultry Sterilizers, De-licers

Sterilization of turkey and poultry equipment, houses and runs with LP-Gas torches is widely practiced although a large portion of both fields remains untapped.

Turkey operators are particularly interested because of their birds' susceptibility to disease spread by lice, germs and parasites.

Torching of infected areas handles the job which cannot be done by electrified "insect traps" only, and if it competed with a price of from one to two cents per kilowatt hour, LP-Gas

could sell within a price range from 36 to 52 cents per gallon. Total load is estimated at more than 5 million gallons.

Incubation

A substantial portion of the turkey egg incubation field is still open to LP-Gas conversion although chicken incubating has not been so well established. More small incubators will be found which are easily converted to gas firing because turkey operators don't raise as large flocks as poultry farmers.

The capacity of each unit is only about two-thirds that of chicken incubators since turkey eggs are substantially larger. It has been estimated that the fuel load in turkey incubation alone, approximates 300,000 gallons.

Cooling—Alfalfa Storage

Use of LP-Gas as a refrigerant in the storage of alfalfa meal, in addition to its service as a fuel in dehydration processes, has been adopted by several companies. Propane is utilized in a simple heat transfer system, keeping storage temperatures from 20° to 30°F cooler than the old-style "well water systems."

Farmers and dehydration concerns are aware of the fact that warm temperatures over prolonged periods materially reduce the carotene content and nutritional value of alfalfa.

Flaming for Pests

One of the principal insect pests encountered in strawberry production is the cyclamen mite, *Tarsonemus Pallidus* (erroneously called strawberry mite). It has spread to most of the states producing strawberries commercially. It is most difficult to control, as the insects are wind-

borne between the strawberry fields and other plants.

The insects penetrate into the leaf sheaths of the strawberry plants, beyond the reach of sprays. The most effective control method yet developed is to burn the dormant plants just before the growing season starts, using a specially designed tractor-drawn, LP-Gas flame machine. Young weeds springing up in the beds are killed at the same time.

Special strawberry flaming equipment is produced by Buck's Butane Service, San Jose, Calif.

Onion thrips cannot be successfully controlled by spraying or dusting, as they live down inside the leaf sheaths. A method of control by severe flaming with LP-Gas torches is being used extensively in the Salinas valley in California.

The success of the method depends on burning the fields when the onions have reached the right stage of growth. Too early flaming kills or stunts the growth of the plants. When the roots have developed far enough to bring the plants through after being wilted to the ground, the insects are killed. Burning at this stage causes a considerable increase in root development which in turn results in the growth of larger onions.

Flame weeding strawberries with special burner made by Ransome Co.



Flaming Alfalfa Fields Kills Weeds and Pests

FLAME cultivation has now been applied to alfalfa stands between cuttings by California's Antelope Valley farmers and an LP-Gas dealer, with excellent results.

Seeking relief from the inroads weed and crop pests had made on their crops, the farmers noted the operation of a commercial "flame weeder" in the valley. After further study of the theory of flame weeding the farmers designed and built a heavy-duty unit which incorporated the basic principles of the row crop design, but which was specifically adapted to the more nearly vertical flaming of field crops.

Specially constructed burners were built of 1½ in. pipe, directing the flame down and backwards at about 20° from vertical. A sheet metal baffle plate runs the entire width of the burner assembly (about 25 ft.) and extends about 8 in. below the tubes' orifices to ground level. Sheet metal panels trail 4 ft. behind the burner assembly and contain flames and hot combustion gases next to the ground. The panels are attached above the burner tubes.

Mounted on two wheels and fed by a 130-gal. propane tank, the flame cultivator is towed by tractor. The unit services four acres per hour at a cost of only \$1.50 an acre, and costs between \$650 and \$675 to build.

Kenny Kennepohl, of Lancaster Gas Co., Lancaster, Calif., designed the propane system, including manifolds and burners.

Farmers were interested in reports that flame cultivation of onions and strawberries had stimulated the

plants to send down heavier root growth to compensate for the loss of foliage—resulting in healthier, more productive plants. They wondered if alfalfa would respond in the same way. But the primary purpose remained the eradication of sand burrs and aphids which had been taking a toll of the valley's crops.

Farmers report excellent results with the experimental machine and several more are to be built. Irrigation after burning is speeded up by approximately 50%. Those who burned their fields in the spring said that 2- to 5-year-old alfalfa was perceptibly stimulated to heavier growth. Farm organizations have devoted large parts of their meetings to reports and discussions on the new flame cultivators.

Experimentation with propane-fired row crop flame weeders extends back as far as 1945. At that time Price C. Lemore was credited with the invention and development of a flame unit on his farm near Montgomery, Ala. It was later temporarily marketed by the New Holland Machine Co., of New Holland, Pa., under the name of the "Sizz-Weeder," and is now manufactured by M & R Farm Equipment Co., Greenville, Miss.

Also responsible for the development of LP-Gas-fired flame cultivators and weeders were the Delta Branch Experimental Station, Stoneville, Miss., and Phillips Petroleum Co. The two organizations designed and conducted exhaustive tests on a propane-burning machine which was an improvement on an earlier oil-burner in operation and economy.

Each pin
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supply of
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It is Shell's long-established policy
to sell propane only within the
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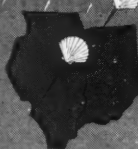


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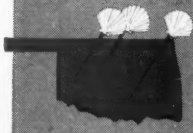
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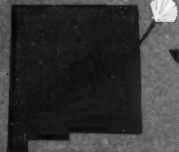
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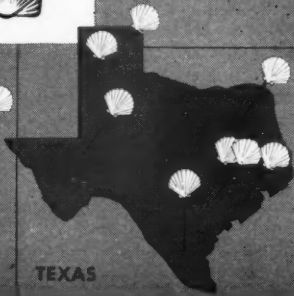
OKLAHOMA



CALIFORNIA



NEW MEXICO



TEXAS

Washington News

By Larston D. Farrar

Special Correspondent

General outcome of the MacArthur-administration fight will be a stiffening of the official attitude toward Communism, which means a step-up in the tempo of re-arming and preparing for an all-out war.

This means that Congress is getting ready to take the wraps off military spending entirely. Build an air force lots bigger than the present one, increase spending on guided missiles, etc. Draft of manpower—foot soldiers—won't be any heavier than it would have been otherwise, but military demands for oil and related products will go higher than ever, faster than was contemplated only a few weeks ago.

There is a new feverishness about "defense" preparations now that was not evident back in early April. Civil defense is being talked more and more in official circles. National Production Authority officials now are certain the metals pinch in the coming 12 months will be worse than anticipated. Inflationary pressures won't be eased, but will grow.

Appointment of Charles E. Webber, of Wallingford, Pa., as director of a newly-established Natural Gas Production and Processing Division in the Petroleum Administration for Defense has been announced here by Secretary of the Interior Oscar L. Chapman.

Mr. Webber, on leave from his post as assistant manager of the natural gasoline department of the Sun Oil Co., Philadelphia, has been chief of the Natural Gasoline and Gas Materials Branch of PAD's Materials Division since January, 1951.

The new division, according to Deputy Petroleum Administrator Bruce K. Brown, will be responsible for action to assure that the natural gas and natural gasoline producing industry of the U.S. will produce (1) the natural gas needed to meet essential industrial and domestic fuel gas requirements; (2) the natural gasoline and allied products needed to meet essential petroleum refining and blending requirements, and (3) the liquefied petroleum gas needed to meet essential industrial and domestic requirements.

Although the new division will report to A. P. Frame, PAD's assistant deputy administrator for domestic petroleum industry operations, Mr. Webber and his staff will work closely with PAD's Gas Planning, Gas Operations and Gas Facilities Divisions, under C. P. Rather, assistant deputy administrator in charge of gas matters relating to transmission, distribution and manufactured gas, Mr. Brown said.

Mr. Webber, who will serve without compensation, was a member of the staff of the Natural Gas and Gasoline Division of the Petroleum Administration for War from June, 1942, to April, 1945, when he was appointed assistant director of the division. He served in that post until October, 1945, when he joined the Sun Oil Co.

Defense Transportation Administrator J. K. Knudson has announced here the delegation to the Petroleum Administrator for Defense the authority, effective May 7, to exercise the control hitherto held by the DTA over facilities for bulk (tank) storage of petroleum, gas, or related products. This delegation does not apply to tank storage of other commodities.

Walter Podbielniak Receives 1951 Hanlon Award

THE Hanlon Award, highest honor in the natural gasoline industry and one of the ranking awards of the entire petroleum industry, was conferred April 26 on Walter J. Podbielniak, president of Podbielniak, Inc., Chicago. The ceremony took place at the 30th annual convention of the Natural Gasoline Assn. of America held in Tulsa, Okla.

Dr. Podbielniak is the fifteenth recipient of the Hanlon Award which is conferred each year by the NGAA for outstanding service to the natural gasoline and cycling industries. Donor of the award is E. I. Hanlon, chairman of the board of the National

Bank of Tulsa, and a pioneer in the natural gasoline business.

The presentation was made by NGAA President James E. Pew, Sun Oil Co., Philadelphia. The citation read in part: "We are today recognizing the part which Dr. Podbielniak played in the early development of practical analytical apparatus and his continuous efforts through the years to improve its accuracy and efficiency until it has become the most valuable single tool in the analysis of gas and liquid hydrocarbons. The low temperature fractional analysis equipment familiarly known as the 'Pod column' in practically every oil company plant and laboratory, is only one of the laboratory devices which he helped to develop or developed exclusively, but the importance of its role in natural gasoline operations could not be over-emphasized."



Walter J. Podbielniak

Several Schools Planned For Coming Months

Proper installation and operating practices will be featured at three service schools, sponsored by the LPGA, which are planned for the near future.

The annual Mid-Continent LP-Gas service school is scheduled for the University of Kansas, Lawrence, on June 25-27.

July 16-18 are the dates of the first Midwest school to be held at Iowa State College, Ames.

The annual Western school, at the University of California, Berkeley, is set for Aug. 29-31.

LP-Gas Papers Featured At API Mid-Year Meeting

LP-Gas was spotlighted at the 16th mid-year meeting of the American Petroleum Institute Division of Refining when it met at the Mayo hotel, Tulsa, April 30-May 3.

"LPG as Motor Fuel" occupied an afternoon group session with such papers and speakers as R. C. Alden, Forrest E. Gilmore, Paul Tucker, Phillips Petroleum Co., Bartlesville, whose paper was entitled "LP-Gas, Over a Million Barrels Daily!" This talk was in turn discussed by H. W. Field, Atlantic Refining Co., John Lynch, LaGloria Corp., and B. R. Carney, Warren Petroleum Corp.

Howard E. Felt, Warren Petroleum Corp., speaking on LP-Gas distribution, discussed the storage problem facing the industry. D. R. Skinner,

Skelly Oil Co., and Frank Matheny, Sid Richardson Gasoline Co., commented on his remarks.

Other speakers and their subjects included: E. W. Voice, Warren Petroleum Corp., "LP-Gas Utilization in Farm Equipment"; Robert S. Lee, Twin Coach Co., "The Propane Story"; Eugene S. Corner, Standard Oil Development Co., and E. H. Berg, Esso Standard Oil Co., "The Relative Economics of LPG, Gasoline and Diesel Fuel in Trucks and Buses."

During a dinner attended by several hundred refiners from all sections of the country gathered for the meeting at the Mayo hotel, G. G. Oberfell was awarded a "certificate of appreciation" by the API Division of Refining for his outstanding services to the API in the fields of automotive research and conservation of natural resources.



Attending the LPG motor fuel conference of the API in Tulsa recently were (left to right): E. W. Voice, Warren Petroleum Corp., Tulsa; R. C. Alden and Ross Thomas (standing), Phillips Petroleum Co., Bartlesville; Eugene S. Corner, Esso Standard Oil Co., New York; Howard Felt, Warren Petroleum; Fred E. Dayes, ACF-Brill Motor Co., Philadelphia; Robert S. Lee, Twin Coach Co., Kent, Ohio.

New! FIRELIGHT FRONT DUO-THERM GAS HOME HEATER!



Exclusive Firelight Front!

Exclusive fine period-furniture styling!

Exclusive Duo-Therm Equaflame Burner!

Exclusive Power-Air Blower!

Revolutionary All-in-One Control!

Two capacities: 50,000 and 65,000 BTU input.

Fully vented!

AGA approved!

Here's the brilliant new Duo-Therm Chipendale with Firelight Front... with the exclusive style, features, and performance that make warmly satisfied customers. It's another great reason why you can count on Duo-Therm—your fastest selling line of gas home heaters. And you can count on Duo-Therm for competitive prices, generous discounts; and a complete line of gas home heaters with capacities from 23,000 to 65,000 BTU input.

Your Duo-Therm distributor will be happy to give you a chance to see for your-

self about this outstanding new model. Or, you may obtain *complete* specifications by writing: Duo-Therm, Division of Motor Wheel Corp., Lansing 3, Mich.

DUO-THERM
*the new standard
in gas home heaters*

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PRACTICAL MANAGEMENT OF AN LP-GAS BUSINESS

CHAPTER 3

How to Raise Necessary Capital

By C. C. Turner

YOUR first thought of raising money to enter the gas business has probably been to borrow it from a bank, but unless you have some collateral to offer there is not much hope for you in that direction. The banking industry will be of little assistance in starting new businesses. However questionable in value may be some of the real estate and "watered" stock accepted as security, they come within approved classifications, while there is universal opposition to loaning money to establish a business.

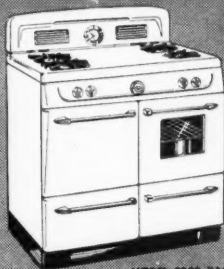
The reason for this is that starting a new business requires what is known as "venture" capital, and "venture" capital might be termed capital which is invested in intangibles. Banks will take mortgages on real or personal property, in



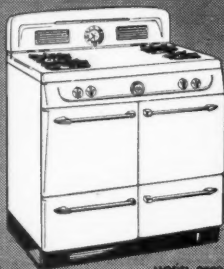
other words, tangible property, but seldom on a man's plans and hopes.

Now there happen to be individuals and companies other than

**NO QUESTION
of Satisfied
Customers with
this
Complete Line**



MODEL 9200 PAC



MODEL 9220

Modern Maid

GAS RANGES

With Deluxe features brought to the popular price field, prospects sell themselves on the beautiful new Modern Maid line of domestic cooking ranges. Modern Maids are the answer to your dreams of a fast-moving, high-prestige product . . . they answer your customer's dreams of a long-service, up-to-the-minute cooking appliance.

Designed especially for use with LP-Gas, the Modern Maids combine rugged, long-life construction with sleek modern design. Each oven is porcelainized inside and out, insulated heavily with Fiberglas. Each burner has an individual drip pan, and manifold covers are recessed for cooler gas cock handles.

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or
Factory Warehouse in
Your Vicinity*
WRITE US FOR DETAILS

TENNESSEE STOVE WORKS
Three Generations of Stove Building
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MODEL 9000



MODEL 77-P



MODEL 77

banks who have money to loan, who see no reason why they should employ a middleman, such as a bank, to loan their money to someone else, and they will more readily take the risks that venture capital involves, but quite often they are the so-called "small loan" companies which charge excessive rates of interest. Even an innocent "only 1% per month" amounts to 12% per year, and no business can pay this rate of interest and survive. Table 3, based upon a \$100 loan only, is an analysis of this kind of financing. It will never serve you any useful purpose in the gas business except as a warning to avoid recourse to such companies, no matter how desperate your financial position may be. Multiply the \$100 base figure to an amount a new gas business might require and see what a loan on this basis would do to you.

Again we must digress for a few minutes. Here is where the intangibles mentioned in Chapter 1 will serve you well. You are going to need something more than just a business plan when you go out to borrow money. First you are going to be asked for security, and if you are not willing to pledge things that you own, such as your home, the question very logically comes into the mind of him from whom you would borrow, "Why?" But even if you can offer collateral, the lender will want to know about your ability, your integrity, and your experience.

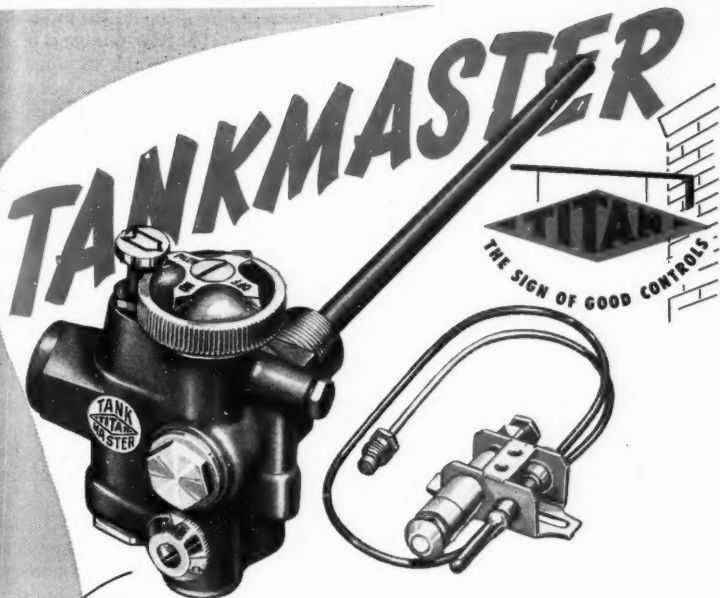
You may be honest to a fault, but many honest men "go broke."

TABLE 3. ANALYSIS OF A TYPICAL \$100* LOAN AS MADE BY LOAN COMPANIES. LOAN TO BE REDUCED \$10 PER MONTH.

<i>Advertised Rate of Interest Per Month</i>	<i>Actual Rate of Interest Per Year</i>	<i>Amount of Interest You Would Pay for Use of \$55 *10 Mos.</i>	<i>Amount of Interest You Would Pay for Use of \$100 for 1 Year</i>
6%	72%	\$33.	\$72.
5½%	66%	\$30.25	\$66.
5%	60%	\$27.50	\$60.
4½%	54%	\$24.75	\$54.
4%	48%	\$22.	\$48.
3½%	42%	\$19.25	\$42.
3%	36%	\$16.50	\$36.
2½%	30%	\$13.75	\$30.
2%	24%	\$11.	\$24.
1½%	18%	\$8.25	\$18.
1%	12%	\$5.50	\$12.
¾ of 1%	9%	\$4.125	\$9.
½ of 1%	6%	\$2.75	\$6.

* If a note for \$100 is reduced \$10 per month, the average amount of money of which the borrower would have use is the sum of the unpaid balances at the beginning of each month divided by 10 or \$55.

You may have great executive ability as an oil appliance distributor, but that doesn't make you a good gas man. Your experience, reputation and demonstrated ability in the gas business will count heavily. If you have not had this experience it is then best to start with some such operating plan as the Commission Agency or Co-operative Plan. Under either of these methods you will be guided considerably by your distributor, and it is well to let him from whom you would borrow know this. In fact, it is advisable for your distributor to accompany you when



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Dependable Water Heater Operation**

For use with **NATURAL GAS
MANUFACTURED GAS
LIQUEFIED PETROLEUM GAS**

Featuring: LARGER CAPACITY • GREATER EFFICIENCY • GREATER SAFETY

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The so-called "small loan" companies charge excessive rates of interest.

you are applying for a loan. He can perhaps explain the fundamentals of the business much better than you can.

Before you apply for a loan there are several things which you must do. First, you must prepare a financial statement. Many people refuse to do this and are stymied right there. Refusal to do it is foolish, first because it implies that you have something which you wish to conceal, second because if anyone wants to know about your financial status they can get the information through private credit agencies, whether you like it or not. If you are not or have not been cooperative with such agencies it is only natural that their report will reflect against you in some respect even though they try to be entirely fair.

In preparing such a report be honest and conservative. First, it is

a punishable offense to publish a false report for the purpose of obtaining credit. Second, if you think that you can make a false statement and bluff your way through, afterward you are going to be found out to your great embarrassment and it will be almost impossible to procure an extension or increase of your loan if you later find this to be necessary.

Next, the one who considers making a loan to you will want to know what you intend to do with the money, and this requires a detailed plan worked out on paper. Here again I caution you to be conservative. Also, do not fail to include costs such as your own wages, transportation expense, rent, lights, insurance, taxes, losses, telephone, printing, supplies, merchandise, etc. An experienced lender will spot any one of these omissions instantly, and your cause is apt to be a lost one before you even get well started in presenting it.

Conservatism Pays

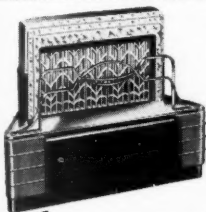
Be conservative about stating what business you expect to do. It is better to have some business lined up in advance and to be able to say "I know that I can do this much business and I hope to do this much more" than the lame statement, "I ought to do this amount of business," or a definite statement that you will do so much business without any foundation of fact.

Third, you must be prepared to give references, and for this I advise you to avoid giving the names

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...GAS HEATING AT ITS BEST!

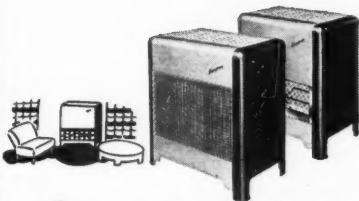
Humphrey Gas Heating equipment will give your customers complete satisfaction in styling, heating performance, and economical operation.



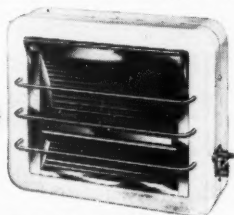
***Humphrey* RADIANTFIRES** One of the most popular gas heaters ever made ... abundant, satisfying heat with all the cheerfulness of an open fire. Vented and unvented models ... manual or automatic operation.



***Humphrey* AUTOMATIC GAS UNIT HEATERS** Completely "packaged" circulated heat for stores, shops, restaurants, garages, factories, etc. No boiler room equipment or fuel storage. Maximum heat output at lowest fuel cost. A size for every need.



***Humphrey* CIRCULATORS** Unsurpassed in ability to produce fast, clean heat ... modern, beautiful styling ... low cost operation. Two models ... Open front Radiantfire Circulators and Closed front Royaline Circulators



***Humphrey* WALL HEATERS** Ideal for bathroom, sunroom, den, playroom and many other places where economical auxiliary heat is needed. Recessed in the wall or mounted on the wall. Easy to install.

There is no substitute for experience. For more than fifty years we have been designing and building gas heating equipment exclusively.



GENERAL GAS LIGHT COMPANY

KALAMAZOO, MICHIGAN

of your clergyman or schoolteachers unless you are asked to do so. The clergyman is apt to be the last person in the world who will know about your faults and your teachers must have a large measure of idealism, otherwise they would not be good teachers.

Business References Needed

If possible, give the names of those with whom you have had credit dealings. The finance company through which you purchased your car is not a particularly good reference because everyone knows that it would take the car away from you if you didn't keep up your payments. The recommendation of a brother lodge member is of little value if it is based on mere brotherhood. Don't get me wrong in this respect, for memberships in fraternal, civic and religious organizations are of distinct advantage if you are a doer in the ranks and not a mere joiner.

If you are young and have never had any business experience, a good word from some established business man will help. Business men watch the younger generation for recruits to their own ranks. You'd be surprised and possibly embarrassed if you knew how many times remarks had been made such as, "There goes Joe Doakes' boy. He's a bright youngster," or "He's got a personality," or "He'll go places in this world" or "There goes Joe Doakes' boy. I don't like him. He's lazy. He's no good. I wouldn't trust him out of my sight."

Now that you have your ammu-

nition prepared, the time has come when you are to use it. Whom will you approach? If you are established in business, you will probably go straight to your banker and borrow from him on the strength of the business that you are in; not on the business into which you are entering.

If you are not established, it wouldn't do any harm for you to see the banker first. He will probably turn you down but you will also probably get some good sound advice from him. If he does turn you down don't go out from the interview resentful or embittered. You must remember that the law tells him the kind of loans that he can or cannot make. If he appears to be cold it is quite likely that this is a defiance which he has thrown up about himself. All day long he is besieged by people with impractical schemes who would like to borrow money and he has to say "no" more often than "yes."

Almost every community has its influential citizen with enough money to back local sports activities. This fact usually indicates



You may have great executive ability, but that doesn't make you a good gas man.

talk about room...you bet!

There's nothing like this exclusive "Staggered" Top

- Use 4 king-size utensils at one time.
- An unhampered reach to each utensil.
- Working surface next to each burner.

Gives You More "Sell" In

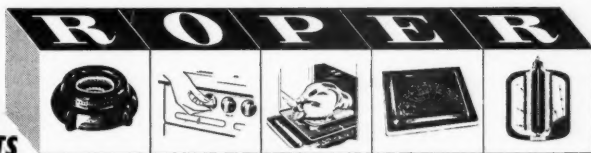
ROPER

"America's Finest Gas Range"

Housewives the nation over are acclaiming the new ROPER. Distinctive beauty... a host of outstanding features... split-second speed... superb performance... all these they find in Roper. ROPER Gas Ranges are designed especially for use with liquefied petroleum gas. Geo. D. Roper Corporation, Rockford, Illinois. Offices and warehouses in principal distribution centers.



Famous Roper CROWNING ACHIEVEMENTS



Alltrol
"Center-Sim-
mer" Burners

"Insta-Flame"
Automatic
Lighters

Large
"Bake-Master"
Oven

"Scientific"
Cooking
Charts

"Roper-Glo"
Broiler
Burner

that his interest in the community is a healthy one and also that he is of the nature to put out venture capital. Quite often there are doctors who have acquired money and are of this same nature. The very nature of a contractor's business makes him of the type to realize the necessity of venture capital. Quite often a successful manufacturer will lend a sympathetic ear. An enterprising merchant might help you if he can resist the temptation to take your project under his own wing.

As a rule lawyers are poor people to see in raising capital for a new business. Many of them have it to invest, but as a group they are overly impressed with their own indispensability to business and their legal training quite often results in insistence upon unnecessary red tape that hampers business. All too often a deal with one of them ends with their owning the business and you working for them.

Hair Splitting

Accountants are apt to be uneasy bedfellows, for their training makes them overemphatic upon system, records, and reports that a young business may not need and sometimes can get along better without.

It is possible that you may be able to interest a close personal friend or some relative. Quite often such backing results happily, but as often it ends in misunderstandings and lost friendships. Their interest in your success is much more than a financial one, for which rea-



An experienced lender will spot instantly any omissions in your estimate of costs.

son they are apt to offer suggestions or criticisms that are meant to be helpful but are quite as often inappropriate. They are going to be hurt if you don't do as they think you should do, and the closeness of their association with you makes them over-sensitive to fancied slights or differences of opinion.

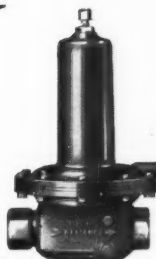
Once you have located a source of venture capital, the old spectre of security for the loan raises its head. The first possibility which always presents itself is that of a partnership. More often than not partnerships come into existence because the fellow with an idea needs the money that some other fellow possesses. Also, more often than not, such alliances come to a bad end. The fellow with the money thinks that he is all-important because the venture could not have been started without his money. The fellow with the idea discounts the importance of the fellow with the money for the reason that the other fellow's money wouldn't have

Silent Masters

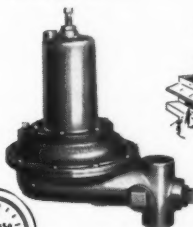
OF HIGH PRESSURE GAS

These High-Pressure Regulators are used by a large number of different industries. From the largest refinery to small industrial plants, they are always on the job, reducing high gas pressure to a low, steady flow of gas that can be utilized to the best advantage.

For complete specifications on High-Pressure Gas Regulators, request Bulletins 47A and 48A.



TYPE HPR is available in several models which allow inlet pressures up to 1000 lbs. (2000 lbs. in bronze) and reduces them to as low as $2\frac{1}{2}$ psi. This wide pressure range, plus compact, rugged construction, makes this Regulator a natural for farm taps, general gasoline plant and refinery installations, and for controlling any high pressure gases.



TYPE HPH is recommended for smaller industrial plants where sensitive regulation and position lock-up are required. This Regulator may be used with inlet pressures up to 150 lbs. and the outlet pressures may be reduced to as low as $\frac{1}{2}$ psi.

**AMERICAN
METERS**

RELIANCE REGULATOR DIVISION

AMERICAN METER COMPANY
INCORPORATED

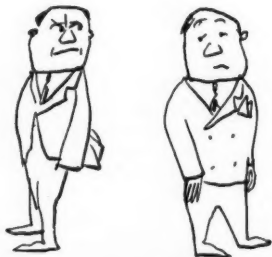
1000 MERIDIAN AVENUE, ALHAMBRA, CALIFORNIA

been of any use if it had not been for the idea.

An ideal partnership consists of one in which each partner has some necessary qualification to contribute to the business other than mere capital. If you have been honest in your self-analysis you must admit that there are some requirements of a successful business in which you do not excel.

If you decide upon a partnership, recognize your weaknesses and try to select a partner who has the qualifications that you lack. Make up your mind from the very start that you are going to rely upon the other fellow when these qualifications are required and resolve from the very start that you will not infringe upon the responsibilities of your partner.

There are other drawbacks to a partnership than personal relationships. In a partnership each partner is responsible for the acts of the other partners. It could happen



Most partnerships come to a bad end—the fellow with the money thinks he is all-important; the fellow with the idea discounts the fellow with the money.

that your partner might be out for a pleasant Sunday afternoon drive and be involved in an automobile accident for which he was to blame because of an error in judgment. The entire business, your home and your personal bank account may be forfeited in settlement.

Partnership Handicap

Another handicap to a partnership is the possible demise of any of its partners. This requires an accounting and division of the business. Quite often the surviving partners do not have the capital to buy out the interests of the deceased, in which case the business must be liquidated. A forced liquidation may mean loss of a substantial portion of your interest in the partnership.

A third possibility is a dissolution of partnership on order of the courts due to the dissatisfaction of either partner. If you do not have the capital to buy the other fellow out you can lose all of your interest in the business in this event.

A partnership can be stalemated by a difference in opinion between the partners unless there is an understanding as to the responsibilities of each partner. It may even then be stalemated due to deference of one partner for the wishes of the other.

For these many reasons I personally prefer a corporation to a partnership although a corporation has its undesirable features. The formation of a corporation requires considerable legal hocus-pocus. After its formation certain formalities, such as meetings and

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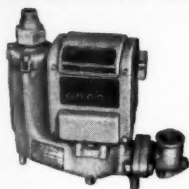
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VS



COLD FIGURES that give you a WARM FEELING!



PRESSURE TO 250 PSI.

To provide complete safety in handling liquid propane under all pressure conditions, Red Seal L-P Gas meters are designed for working pressures up to 250 psi. Ask for Bulletin 779.

There's nothing like the warm feeling you get when you know accurate L-P gas meters are keeping track of your inventories, preventing losses, and giving you figures that "add up" month after month.

And there's no substitute for the dependable accuracy you find only in Red Seal meters, resulting from the utmost in design, materials and machining precision. Only one moving part in the measuring chamber, with positive, non-wearing seal of a capillary film of oil. No intricate valves, leathers or piston rings. It's all so simple there's little to go wrong if properly installed. Put Red Seal meters at all key points—in bulk plants and on tank trucks—for accuracy you can bank on. Just phone your nearest Neptune jobber or Branch Office.

Neptune's exclusive unit replacement plan assures quick and easy replacement of work-worn parts.

NEPTUNE METER COMPANY
50 WEST 50TH STREET • NEW YORK 20, N. Y.

Branch Offices

ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER
LOS ANGELES • LOUISVILLE • No. KANSAS CITY, MO. • PHILADELPHIA
PORTLAND, ORE. • SAN FRANCISCO • Canadian Factory: LONG BRANCH, ONT.



20-2

detailed reports, must be made. Because of the sins of some corporations all of them bear a certain amount of public stigma as being impersonal and unprincipled. The tendency of taxation is to make it increasingly difficult for a corporation to exist. The records of a corporation are, under certain conditions, open to public inspection, its earnings and financial condition approach common knowledge.

Corporate Advantages

I believe, however, that these disadvantages are more than counter-balanced by the stability which corporate existence offers. Its control rests with the majority of stockholders. If any stockholder gets into personal financial difficulties only his own stock in the company is jeopardized. If any stockholder doesn't like the way things are going in the corporation, all that he can do about it is to vote against the officers who sponsor the policies that he doesn't like, and if he doesn't like the result of the voting all that he can do about it is to sell his own stock in the company. Even this right of sale can be limited by a requirement that the stock shall first be offered back to the company at a specified price and that the company shall have a specified length of time to take advantage of his offer.

A corporation continues to operate without interruption at the death of any of its stockholders or officers, and it can continue to exist forever just as long as it remains solvent, pays its taxes, complies

with the law, and the will of the majority of the stockholders is that it shall continue to exist.

If you do decide to incorporate, make sure that you have ownership or control of the majority of the common or voting stock. Never enter into any deal which jeopardizes this control and never pledge it as security for any loan. If additional capital is required at any time, consider the possibility of non-voting preferred stock on which cumulative interest is payable, but make sure that a condition of the stock's issuance is that it may be redeemed by the company at not more than 5% above par at any time.

It would be well for you to get another matter straightened out in your mind before incorporating. Whether or not you own the majority of the stock of a company, you do not own the company. If you work for it you work as a salaried employee. Ownership of stock in a company does not guarantee you employment by that company and your tenure of employment is dependent upon the



Ownership of stock in a company does not guarantee you employment with that company.

GET IN ON ...

the Greatest Promotion in the Range Industry



RATE YOUR RANGE...

How close does it come to

Perfection

Here's your opportunity to rate your present or your future gas range! Check this list of important features... see how close the range you have in mind comes to Perfection. (Score sheets for electric and oil ranges appear in other advertising or can be obtained by writing.)

SCORE: **BATING!** Your ideal was never so close!
 100 — perfect rating means you own a Perfection, the only gas range with all the features!
 70-99 — an average rating with this range you do as much work as the range you're rating for less than Perfection!
 50-69 — an average rating you work as hard as the range you're rating for less than Perfection!
 30-49 — an average rating you work as hard as the range you're rating for less than Perfection!

There's a new sales-making idea in the range field which does the slickest selling job you've seen in a long time. It's Perfection's "Rate Your Range" series of ads that will have homemakers all over America checking gas, electric or oil ranges to find out "how close they come to Perfection". Make sure this campaign works for you! Get a supply of these detailed check lists for your customers from your Perfection salesman—or by writing directly. They're truly terrific sales-stimulators!

You'll find them enlightening, too, when you check the features of the ranges on your floor against those Perfection offers! You'll find . . .

You can't beat
Perfection
 Gas... Electric...
 Oil Ranges

PERFECTION STOVE CO.
 7269-A Platt Avenue
 Cleveland 4, Ohio



officers of the company who are elected by the stockholders. It is therefore obvious that if you do not own the majority of the voting stock you are not secure in your position, and you are practically in the position of working for someone else.

All of this leads back to your benefactor who may loan you money with which to start the company. He will probably want to own stock in the company. He may try to insist on owning a controlling interest. If he does you had better forget about him, for you would be just as well off to let him go ahead, form the company, then work for him for a daily wage without investment in or responsibility for the company. If this is your position in the set-up, what advantage is there to you that the company should ever be formed?

There is a fundamental involved. If you haven't the money to invest, then someone must have enough faith in your ability and integrity to invest in YOU. Even if you do have money to invest and cannot persuade others to go along with you, then you have but little chance to make a success in the gas business.

I repeat that our industry is in its infancy and that its possibility of development is almost limitless. If, however, you cannot persuade one person to invest in your proposition, how can you hope to persuade the thousands of people who are waiting for liquefied petroleum service to invest in the appliances necessary for its use? They also must have faith in you!



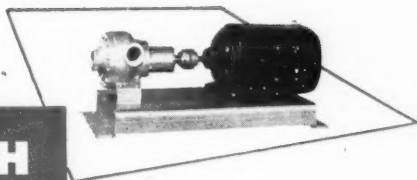
The most successful gas men I have ever known pulled themselves up by their own boot straps.

Have you tried to borrow money and failed? Has it discouraged you? It shouldn't. It is the very fact that the gas business is not understood by banking interests that makes it possible for the little fellow to gain a foothold in it. If they did understand it, this liquefied petroleum gas business would have been an integrated business long before this.

If you still wish to go into the gas business and have the necessary qualifications—a little money of your own and the determination to work hard and make sacrifices—you can make a go of it. The most successful gasmen that I have known started with little or nothing and literally pulled themselves up by their bootstraps. Perhaps the sense of values which they acquired by getting started in this way has been responsible for their success.

No. 1 IN A SERIES
DISCUSSING
THE MOST EFFECTIVE
SERVICE RANGE
FOR

SMITH
PRECISION
Butane-Propane
PUMPS



MODEL

MC-1044

RATED TRANSFER CAPACITY
20 GPM AT 1800 RPM



Recommended for filling 100 lb. cylinders, small tanks, and fuel tanks on trucks and other motor vehicles from bulk plant storage.

When properly installed and driven by a 1½ HP motor, model MC-1044 will develop 40 PSI differential pressure and sufficient capacity to deliver to a truck fuel tank through the usual type meter assembly and 1¼" filler valve at the rate of 15 to 20 GPM. It will also fill up to three 100 lb. cylinders on a manifold every five or six minutes.

If faster cylinder filling is required, a 2 HP motor may be used, which will drive the pump to 75 PSI differential pressure. This higher pressure permits filling up to three cylinders simultaneously in three to four minutes.

This pump is equipped with our exclusive self-adjusting packing which requires no attention of any kind and does not leak during an exceptionally long service life.

Write for further details on these and other Smith Precision bulk plant or truck mounting pumps. There are 13 models available covering a range of capacities from 20 to 150 GPM for direct drive at 500, 900 or 1800 RPM, including models with special steel housings for use in hazardous locations.

SMITH
PRECISION PRODUCTS COMPANY

1135 MISSION ST., SOUTH PASADENA, CALIF. • PHONE PYRAMID 12293

Products

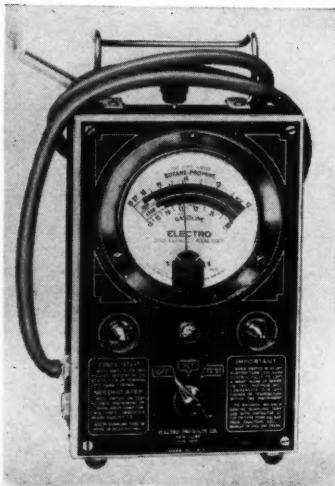
Combustion Analyzer

Electro Products Co., 445 E. 189th St., New York 58.

Model: Mixture Master EB.

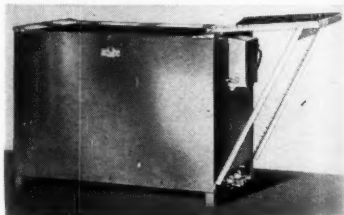
Application: Tests carburetor for rich, idle, average, lean, and acceleration pump discharge.

Description: The analyzer features a large, highly sensitive meter with 3-color dial. The dial is calibrated in large, easy-to-read type. An aspirator pump allows recalibration without waiting. A portable instrument, the unit can be used for both shop and road tests. It is furnished complete with self-contained batteries, 12-ft.



gum rubber sampling hose, tail pipe connection, and operating instructions.

The long-life, precision calibrated analyzing cell gives fast response to mixture changes and is not affected by exhaust moisture.



Scalding Vat

Pickwick Co., 221 Third St., N.E., Cedar Rapids, Iowa.

Model: 5A100.

Application: Large scale poultry scalding.

Description: Equipped for LP-Gas, this unit features automatic water temperature control and also regulates the water level. It has specially designed burners, mineral wool insulation of the tank, and a drain table attachment. The illustrated model is of 100-gal. capacity, although the line includes 60- and 35-gal. sizes.

LP-Gas Valve

The Okadee Co., 332 S. Michigan Ave., Chicago.

Description: Ranging in size from 1/2 in. to 6 in., these full opening,



flanged and screw-type cast steel valves have hard, metal-to-metal seats and discs. The valves bear Underwriters' Laboratories approval for use with LP-Gas.

Gas Equipment Supply Co., Atlanta, Ga., and Gas Equipment Co., Inc., Dallas, Texas, have been appointed exclusive distributors for the Okadee valves in the South and Southwest.

Egg Washer

Barker Poultry Equipment Co., Ottumwa, Iowa.

Model: Barker Egg Washer.

Description: Two sizes are available: large, 6 ft. 6 in. long and 3 ft. wide, handles 14 cases per hour. Small, 4 ft. 6 in. long, 19 in. wide, handles 7 cases per hour. For operation on LP-Gas, a simple, side-arm heater is attached to the end of the tank.

Produce houses, co-ops, and breaker plants are ideal prospects for the installation of this equipment. The machine sanitizes eggs to kill bacteria

on the shells and then cleans, rinses and dries. After the eggs pass through the drier, they are completely dried by forced, unheated air and then are ready for candling and processing.

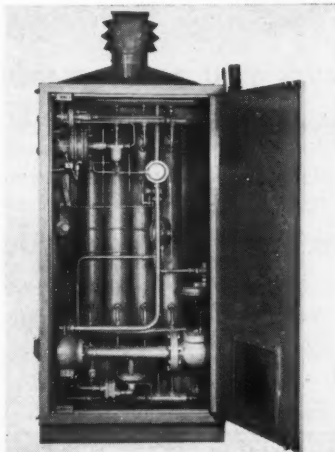
Gas-Air Plant

GasAir Associates, 1072 Bryant St., San Francisco.

Model: HG.

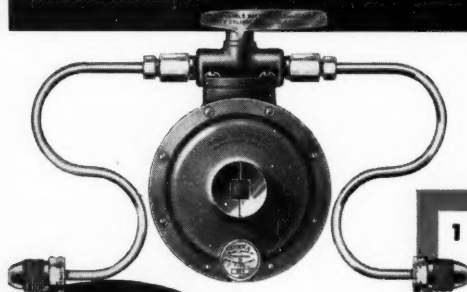
Application: Utility, industrial and standby use.

Description: A new line of LP-Gas vaporizers, mixers and combined vaporizer-mixers introduced by Gas-Air are available in direct-fired and steam types. One of the main changes in design is incorporation of a new type heat exchanger which is said to store less fuel while having a higher heat transfer with positive heat control. The manufacturers indicate that constant temperatures are maintained during all ranges of output



FISHER®

Presents a NEW and FINER MANUAL CHANGEOVER REGULATOR



TYPE 924

Manimatic

GIVES YOU THESE FEATURES

Capacity of over 250,000 BTU
per hour • • • Dependability •
Compact design • • • Economy •
Fine performance

FOR THESE IMPORTANT JOBS

Cooking • • • • Refrigeration •
Water heating • Clothes drying •
Incineration

- 1** The new manual changeover manifold is **COMPACT, DEPENDABLE** and it's **PROVEN**.
- 2** Fisher inverted flare connections for full capacity flow.
- 3** Sturdy POL inlet connections (other types as desired).
- 4** Includes the high capacity proven performance Type 922 regulator with exclusive flanged inlet.
- 5** $\frac{1}{2}$ " female pipe thread outlet for full size appliance piping.
- 6** Two $\frac{1}{4}$ " full size inverted flare by POL 20" pigtails.
- 7** Large effective diaphragm area for fine performance.
- 8** Just turn full size handle to withdraw from other cylinder.

FISHER GOVERNOR COMPANY, Marshalltown, Iowa

LEADS THE INDUSTRY IN RESEARCH FOR BETTER GAS PRESSURE CONTROL

demand, thus producing an air-mix gas with a minimum of Btu variation.

The vaporizers are available in sizes from 40 to 800 gal. per hour. Mixing equipment is sized from 500 to 200,000 cu. ft. per hour of gas-air mix—ranging from 550 to 1600 Btu.

The completely packaged gas plant is compactly cased and designed for outdoor installation. Presently operating units may be changed to incorporate features of the new models. The manufacturer will supply the necessary information and estimates upon request.

Stock Tank Heater

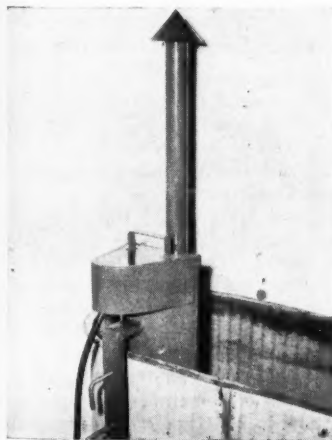
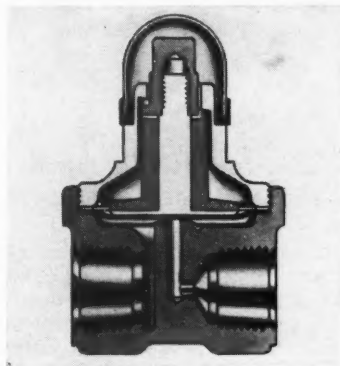
Nebraska City Iron Works, Nebraska City, Neb.

Model: G-50.

Description: This unit is equipped with a 8500 Btu burner and safety controls. Little space is required in the tank for the heater. It is self-sinking and is equipped with clamps

for fastening to the side or end of tank.

Water is kept at a drinkable temperature in the most severe weather. The heater is constructed of heavy gauge steel with heavy gauge baffles in heat chamber to reduce loss of heat through the stack. This design also prevents the burner from being blown out by the wind. Condensation is reduced to a minimum.



Cut-off Valve

Bastian-Blessing Co., 4201 W. Peterson Ave., Chicago, 30.

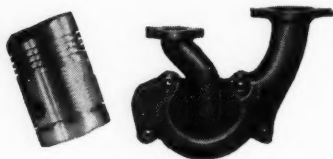
Model: Rego No. 2938 (three-purpose).

Application: Designed for installation immediately ahead of each LP-Gas appliance. It combines the functions of an automatic cut-off valve, a manual shutoff valve, and an excess flow check valve all in one unit.

Description: The automatic cut-off feature safeguards and protects against the hazard of free discharge of unconsumed gas by closing in the event of temporary failure of the gas supply or a dangerously low service line pressure. Service to the ap-

pliance cannot be resumed until the dangerous condition has been remedied and then the valve must be reset manually.

The body and bonnet of the valve are die cast with a special protective coating to protect against corrosion. A reinforced diaphragm assures long life.



Cold Manifold & Pistons

Johnson Machine Shop, Howard St., Pontiac, Ill.

Description: The dome-head aluminum pistons are 40% lighter than cast-iron types and are said to start easier, run smoother, have less vibration, and save fuel. Fifty percent quicker load pickup is reported.

The cold manifold is for use on John Deere and International Harvester tractors. It maintains constant flow at required temperature. It does not freeze under any operating conditions.

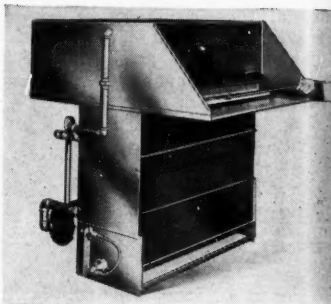
Tray Washer

Gordon Johnson Co., 2519 Madison Ave., Kansas City, Mo.

Model: Wizard

Application: This tray and equipment washer handles all cleaning jobs in small and medium size hatcheries.

Description: Featuring sanitary, spray washing, the unit will clean 60



to 80 trays per hour and up to 120 trays per hour if pre-soaked. It handles all kinds of feed and water troughs and can be used to wash brooder sections.

Compact design and simple erection are features of the washer. It requires no water hookup nor sewer connections; has its own tank and gas heating system.

Specifications: 59 in. high; 53 in. wide; 61 in. deep. Tank (50 gals.) measures 20½ x 46 x 12 in. Pump capacity: 55 gal. per minute.

High-Compression Inserts

Hollingsworth, Stempel & Co., Ollie, Iowa. (Distributor: Hi-Compression Products Co., Box 470, Washington, Iowa).

Model: Hollingsworth Hi-Compression System.

Application: For installation in converted farm tractors. John Deere Models A, AO, AR, B, BO, BR, G, D, H. Allis Chalmers Models WC, WF, WD, Farmall models F-12 F-14, F-20, F-30 10-20, and Models H & M.

Description: The Hi-Compression insert and cold manifold increase the compression in tractor engines converted to LP-Gas. Inserts are placed

NORDSTROM VALVES

for LP-GAS

safest for all lines

Pressurized lubricant
insures positive seal

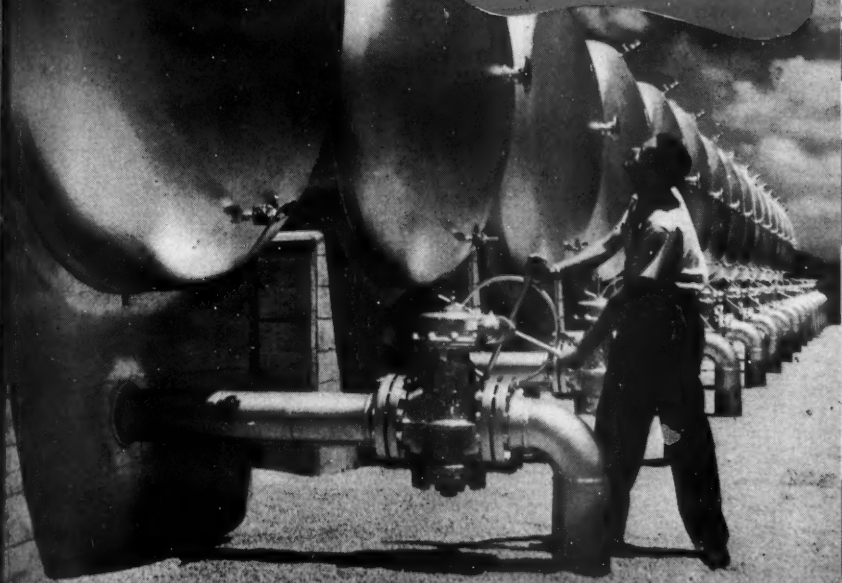


Fig. 2024
1/2" to 4"



Fig. 2025
1" to 4"



Fig. 2045
1 1/2" to 6"



Fig. 1014
1/2" to 2"

Nordstrom VALVES

AUTOMATICALLY LUBRICATED WITH HYPERMATIC
ROCKWELL Manufacturing Company
Pittsburgh 8, Pa. Offices in all principal cities

SERVING
Bulk Plants
LP Tank Trucks
Storage Tanks
Transfer Lines
Bottle Fillers
Loading Racks
Pump Lines



in the combustion chamber, reducing the combustion space. They do not move or touch any of the working parts. A small flange around the outer edge keeps the insert from going into the cylinder.

Advantages include: Stepped-up pulling power; increased daily work output; standard parts of motor are not changed—still has original balance and design; low-cost installation. The design of the insert tends to center fuel explosion nearer center of piston to cut down blow-by.

Tank Trailer

Baron Manufacturing Co., Inc., Box 1432, Oxnard, Calif.

Model: Baron Tank Porter.

Application: Designed to haul propane tanks, spheres and cylinders.

Description: This trailer can haul containers with capacities up to 1200 gals. It has a 3-ton capacity and an inside clearance of 52 in. It is claimed

that one man using the trailer can load, deliver, and set a 1000-gal. propane tank.

Pump Catalog

Peerless Pump Div. has recently issued a comprehensive catalog describing and illustrating a broad line of general purpose pumps. It describes Peerless "Fluidyne" pumps of the horizontal, end-suction, centrifugal type, driven by electric motors in sizes from ¼ to 15-hp, and affording a capacity range of from 10 to 5500 gals. per minute. Liquid can be pumped against heads up to 260 ft.

Fluidyne pumps are particularly adapted to continuous-duty pumping of water and other clear liquids in a wide variety of services as well as for application to system assemblies, such as air conditioning, bottle washers, commercial laundry equipment, dairy equipment, etc.

Copies of the bulletin, B-2300, are



Baron Trailer.

Sell Fireplace Cheer

Your customers will like this Fireside Heater that looks like rustic oak logs. It has the cheer and warmth of an open fireplace . . . yet circulates heat throughout the house.



The GLO-FIRE Gas Log is constructed with an exclusive patented combustion principle. It gives **ODORLESS** heat because the gas is completely consumed. It gives **ECONOMICAL** heat, because there is no waste. The ceramic walls of the GLO-FIRE log retain and radiate heat after gas is extinguished. It gives **EFFICIENT** heat because the heat circulates . . . evenly throughout one room or an entire house.

6 EXCLUSIVE GLO-FIRE POINTS OF SUPERIORITY

ODORLESS . . . patented-combustion chamber insures complete gas consumption.
ECONOMICAL . . . no waste . . . more heat with less fuel consumption.
EFFICIENT . . . the only gas log that provides circulating heat.
DURABLE . . . made of rigidly tested hi-test fire clay.
DECORATIVE . . . correct in any type of room or interior.
AGA APPROVED . . . for Natural, Manufactured, LP and mixed gases.

Glo-Fire Inc.

2224 Beverly Boulevard • Los Angeles 4, Calif.

Southern Distributor
GAS APPLIANCE CO., INC.

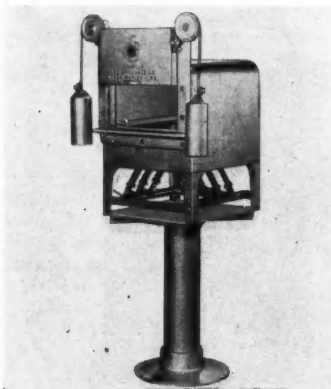
813 Howard Avenue, New Orleans 12, La.
Warehouse Stocks also in Memphis and Birmingham



available from Peerless Pump Div., Food Machinery Corp., 301 West Avenue 26, Los Angeles 31.

Industrial Equipment Catalog

A detailed catalog, containing 23 pages of information on the Johnson line of burners, furnaces—melting,



hardening, tempering and annealing—valves, torches, mixers, and blowers, has just been issued by the Johnson Gas Appliance Co., Cedar Rapids, Iowa.

Furnaces described include heat-treating types in bench or pedestal models and hardening, tempering and annealing types. Furnaces combining heat-treating, tempering, and pot-hardening are illustrated.

Johnson Gas Appliance also produces hand torches for such applications as singeing poultry and hogs, paint burning, pre-heating, soldering. All equipment described in this catalog, No. 50, including stock tank and hog fountain heaters is made for use with LP-Gas.

Heat-Treating Bulletin

Descriptions of its complete line of standard rated furnaces for every tool-room heat-treat requirement are contained in a new illustrated bulletin, SC-151, just issued by Surface Combustion Corp.

Detailed information is presented on the company's controlled atmosphere furnaces and generators, in addition to direct-fired, forced convection, and pot furnaces. Oven-type direct-fired furnaces, horizontal and vertical types, pit-type forced convection, and rectangular or circular pot-type furnaces for hardening and annealing, tempering and drawing, and salt-bath drawing and nitriding are described.

Copies of the bulletin are available from Surface Combustion Corp., Toledo 1, Ohio.

Combustion Catalog

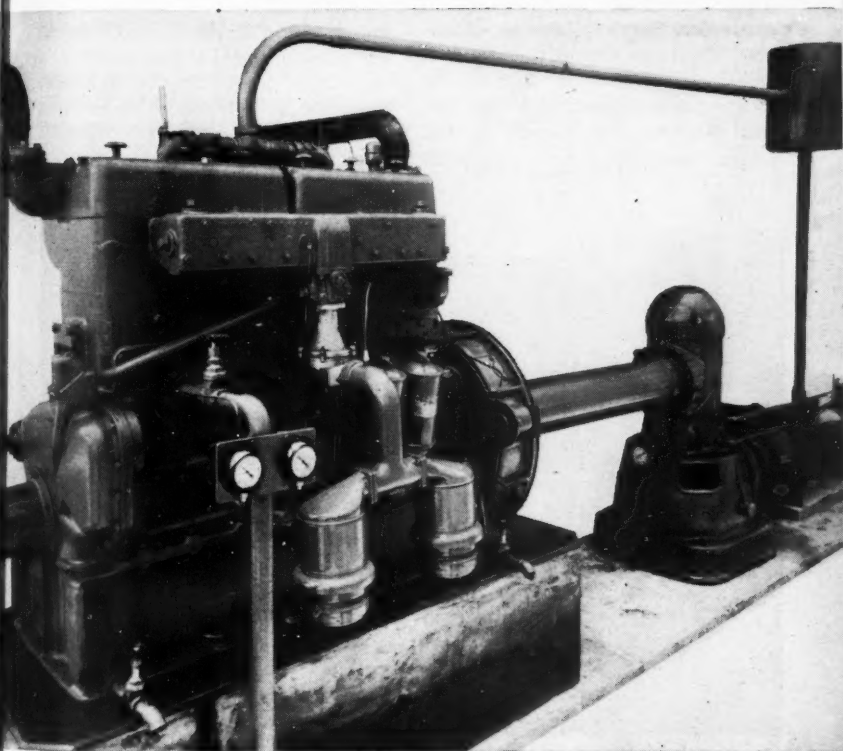
"Protectoglo Combustion Safeguard for Industrial Gas-Fired and Oil-Fired Burners," Catalog 9601, has recently been published by the Minneapolis-Honeywell Regulator Co., Industrial Division. This 32-page catalog is actually a complete manual on flame failure protection for industrial applications.

Included in this catalog is information on the new "flame-rectification principle" of operation, descriptions of the many types of system components, installation drawings, bills of material, comprehensive information on twenty-four different safeguard systems, and an enclosed price list.

Copies of Catalog 9601 may be obtained from the Minneapolis-Honeywell Regulator Co., Industrial Division, Wayne and Windrim Aves., Philadelphia.

BUTANE-PROPANE **POWER** SECTION

Installations CARBURETION Conversion



Pumping Irrigation Water with LP-Gas (See Page 86).

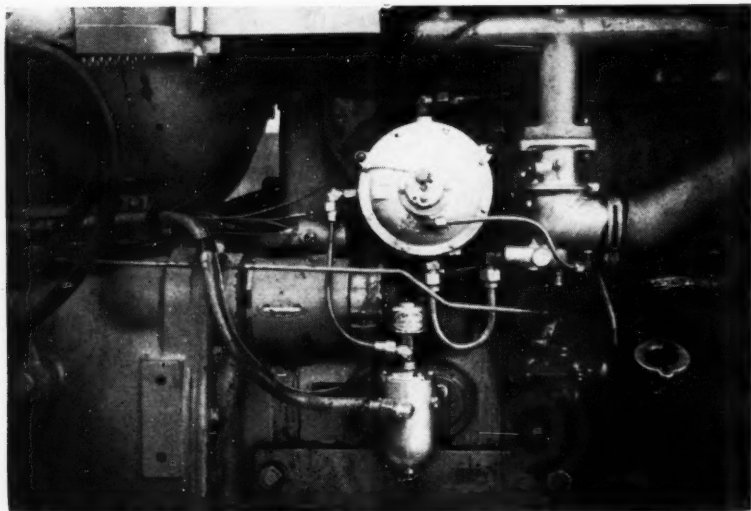
CONVERSIONS

Business-Like Development of Engine Conversions Pays Off for Dealer

WHEN C. F. Butterworth took over the management of the Magic Gas Service, Inc., at Ortonville, Minn., he found that he had landed right in the middle of the worst problem confronting the rural LP-Gas distributor. In the winter months, when deliveries

By Carl Abell

were most difficult and expensive, the demand for LP-Gas reached a very high peak. In the summer, when the volume could be handled with the least expense, demand reached its lowest point.



Minneapolis-Moline tractor conversions made in Magic Gas shop.

The investment in plant and customer storage and delivery equipment had to be set up to meet the winter volume. During several summer months, the company's bulk plants at Ortonville and Appleton, Minn., and Milbank, S. D., were operating at half capacity, customer storage was used principally for domestic cooking and water heating, half the delivery equipment was idle, and half the drivers were laid off. The overhead went right on, and profits were slim. It simply didn't make sense.

It was obvious that if the summer volume could be built up, a greater amount of fuel could be delivered during those months than during the winter, and at less cost. Overhead would be practically the same per year. The principal difference would be the extra accounting and billing costs.

Keep Same Crew All Year

With the proper balance between winter and summer volume, it would be possible to maintain a steady year-round payroll, minimizing the necessity of hiring and training new employees, which is always an expensive procedure. Being able to offer steady employment, the best available help could be attracted.

The "balanced load" would, therefore, result in a much higher net profit with almost no increase in investment. How to balance the load was the problem.

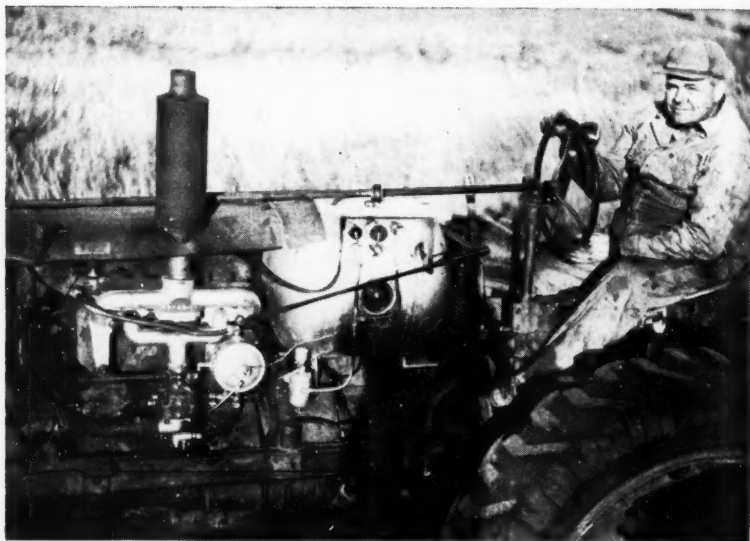
Convinced that he could profit by the experience of others, Mr. Butterworth read everything he could

find on the subject. Articles appearing in *BUTANE-PROPANE News* pointed out that in an agricultural area such as he served, the quickest and easiest way to develop summer business would be through tractor conversions. From the available data, it appeared that if somewhere between 10 and 15% of the tractors in his operating territory were to be put on LP-Gas, the throughput at his plants would be doubled, practically all of the new volume would come during the months when there were little or no space heating requirements, and the plants and facilities would be operating at close to peak capacity throughout the year.

Farmers Are Cautious

LP-Gas carburetion was not exactly a new idea in southern Minnesota. He found that it had been tried in a small way, and while some installations were very satisfactory, there had been others that had, to use the farmer's phrase, "gone sour." Farmers are generally cautious people, and they have a habit of swapping experiences. One installation that goes bad does enough harm to offset the good of a dozen satisfactory operations.

Investigation disclosed that most of the failures could have been avoided. Either the equipment selected was wrong for the job, or the engine was in such poor condition that it could not give satisfactory performance on LP-Gas or any other fuel, or the owner had not been provided with the necessary operating and service information.



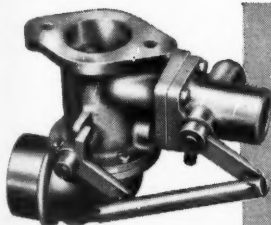
Farfall tractor more than 25 years old, converted to LP-Gas. Thermosyphon cooling of engine is no barrier to satisfactory operation.

Most of the local difficulties could be traced back to errors in human judgment. With the proper policies and reasonable foresight, most of them would never have happened. As is the case in other business activities, the problem boiled down to this: Finding out what is right, and doing as much of it as possible; finding out what is wrong, and doing as little of it as possible.

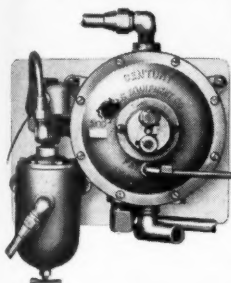
Mr. Butterworth had formerly operated businesses dealing in encyclopedias and automobiles. In each of these lines, he had been provided with operating plans and programs which were based on long and extensive experience, and

which were known to be successful if followed with diligence and judgment. There were no such plans or programs available in the LP-Gas carburetion field. There were not even any books available to provide a dealer with the mechanical and merchandising background for the development of his own program. Yet it was known that one converted tractor would consume about the same amount of LP-Gas as 20 domestic installations using the fuel for cooking and water heating only.

With these facts in mind, Mr. Butterworth set out on a tour of investigation which extended



Model 3-C Century Carburetor is not sensitive to altitude, temperature or atmospheric conditions.



Model M-2 Century Converter with Strainer & Fuellock.

**They go
together
to reduce
tractor
operating costs**

EASY STARTING and perfect idling are assured on any tractor equipped with a Century 3-C Carburetor because it's a metering valve type—not a venturi type. It proportions air and fuel to exact ratios, just *set it, seal it, and forget it.*

Century Carburetors are built for use on John Deere, Ford, Ferguson, Case, Oliver, Massey-Harris and Minneapolis-Moline tractors. They are sold only through distributors or original equipment manufacturers.

**SET IT
SEAL IT
AND FORGET IT**

CENTURY

Oldest Manufacturer of LP-Gas Carburetion
CENTURY GAS EQUIPMENT CO.
11188 LONG BEACH BLVD., LYNNWOOD, CALIF.

**CARBURETORS
for LP-Gas**

through most of the winter and spring of 1949-50. His investigations took him through Minnesota, Wisconsin, the Dakotas, Wyoming, Nebraska, and Kansas during the coldest season.

He found persistent reports that LP-Gas-equipped engines were hard to start when the temperatures were low. Visiting every converted tractor that he could find, he did encounter a considerable number that gave starting trouble. The owners invariably blamed it on the fuel. But on neighboring farms he found other tractors that started with no difficulty whatever, even at temperatures as low as 20° below zero.

Electrical System at Fault

Study of a large number of cases revealed that the difference was more closely related to the electrical system of the tractor than to any other factor. Batteries are known to lose their efficiency as the temperature goes down. A new battery will put out only 40% as much current at 0° as it will at 80°. And a battery is only new once. It is never again quite as good as it was when first put in service.

It became evident that most of the starting trouble resulted from inadequate cranking speed and a weak spark. The rundown electrical systems were just incapable of turning the engine over and supplying the little extra "oomph" that is necessary to fire the LP-Gas. But if the tractor had an adequate electrical system, in good condition

throughout, and the operator understood the correct starting procedure for his particular LP-Gas carburetion system, starting trouble was very rare indeed.

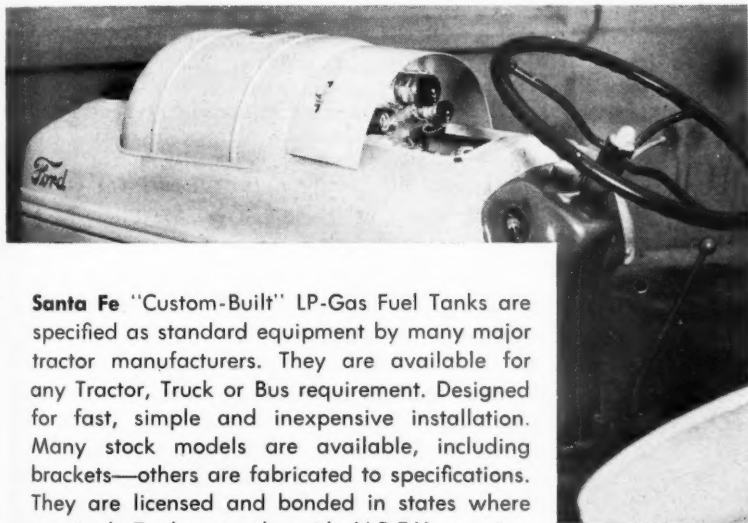
Here was point No. 1 in the Magic Gas conversion program—never turn out a job in which the electrical system has not first been brought up to first-class condition. The same line of reasoning led to the next point—an engine which needs reconditioning to operate on gasoline will need the same reconditioning to operate on LP-Gas. This work should always be done before the conversion, so the owner may be assured of a long period of satisfactory operation, and will not blame the fuel for engine failures due to prolonged use and wear which occurred prior to conversion.

Careful Workmanship Wins

A third point also became apparent in connection with the workmanship of the conversions. Neat, workmanlike installations not only have a psychological value in giving the impression that the conversion is really a well developed, thoroughly engineered application—they also give more satisfactory service than sloppy, "hay wire" installations.

It became evident that the conversions that were most satisfactory under all operating conditions, winter and summer, were the "all-out" conversions which included high compressions, cold manifolds, liquid withdrawal fuel system, and single-fuel LP-Gas carburetor.

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LP-GAS FUEL TANKS
FOR TRACTORS AND TRUCKS
"Custom-Built"



Santa Fe "Custom-Built" LP-Gas Fuel Tanks are specified as standard equipment by many major tractor manufacturers. They are available for any Tractor, Truck or Bus requirement. Designed for fast, simple and inexpensive installation. Many stock models are available, including brackets—others are fabricated to specifications. They are licensed and bonded in states where required. Tanks comply with N.B.F.U. requirements. U.L. approved valves — excess flow protection. Highest standards of engineering, materials and workmanship.

Write for specifications and counsel

Santa Fe **ENGINEERING & EQUIPMENT CO.**

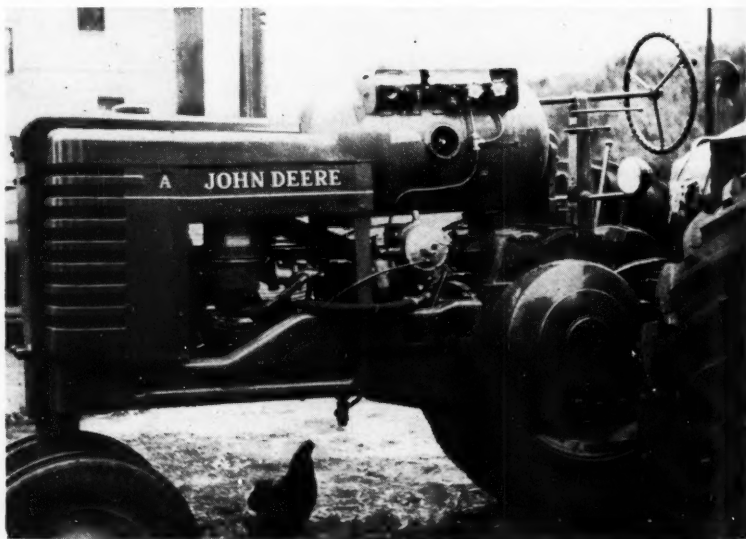
**MAYWOOD, CALIFORNIA, 3810 Fruitland Ave.
TULSA, OKLAHOMA, 2830 Sand Springs Road**

In order to round out his investigation and take advantage of all the experience of others, Mr. Butterworth continued on through Texas, New Mexico, and California, visiting all of the principal LP-Gas carburetion equipment manufacturers. He saw how they built and serviced their equipment, talked with their service engineers, and studied their sales and promotion programs.

Mr. Butterworth arranged to take on the distribution of Century carburetors and Santa Fe tanks for Minnesota, the Dakotas, and part of Wisconsin. The program which he worked out included an installation shop at his central plant in

Ortonville to take care of conversions in the three counties served by his bulk plants, and the establishment of carburetor dealerships to serve the rest of the territory covered by the carburetor and tank franchises.

The "home shop" occupies the ground floor of a building 24 by 44 ft., and includes stockroom for carburetion equipment, parts, tanks, and a small supply of necessary electrical and ignition equipment. In addition, there are benches, working space, and all tools and testing equipment needed to handle the shop volume. The testing equipment includes a complete bank of Simpson instruments for carbure-



Conversion of John Deere, 2-cylinder tractor is successfully accomplished with cold manifold, high pistons, and Century carburetion.

tors and the electrical system, synchroscopes for testing and adjusting distributors, and portable vacuum and compression gauges, AVR sets, electric tachometers, condenser testers, air-fuel-ratio analyzers, and water manometers. This portable equipment is convenient for work in the shop, and necessary for service calls.

The shop work is limited to installation of carburetion and fuel equipment and the related work on the electrical and ignition systems. All machine shop work and engine overhauling required before conversion is done elsewhere, before the installation of the carburetion equipment takes place. The original shop was outgrown within the first year, and an ell addition, 36 x 24 ft., has been added. Volume has grown to about 25 conversion sets per month through both retail and wholesale departments.

Truck Changeovers Come In

A good many truck conversion jobs, which were not originally contemplated or planned on, are now coming to the shop, some of them from as far away as St. Paul, which is practically across the state. Tanks for the conversions are now bought in carload lots. Twenty-five models of tractor tanks, covering all the leading tractor makes and models, are carried in stock.

Training of mechanics and service representatives has been an undertaking of considerable importance. Mr. Butterworth does this work personally, using such

service information as is available from the Century carburetor factory, Delco and Auto-Lite electrical companies, and such other information as he has been able to acquire. For his own shop and service help he prefers to have young men of pronounced mechanical ability who grew up on farms, and who have not had extensive experience in automotive shops. It is his belief that these men are more analytical and ingenious, and their training in his way of work is simpler because they do not have to unlearn any previously acquired shop practice habits which do not fit in the conversion program.

Establishing dealerships presents another training problem. It is obviously poor practice to sell a new dealer a few carburetors and tanks, and then leave him out on a limb to work out his own salvation. The new dealer is required to send a tractor, ready to be converted, to the Magic Gas shop, together with at least one mechanic. The dealer's mechanic goes through the same training as the Magic Gas employes, and then performs the conversion on his employer's tractor under the supervision of the experienced mechanics. This system has been very satisfactory. Additional men are trained for dealers when needed, and expert servicemen from the distributorship follow up with periodical calls at the dealers' shops, and emergency help if required.

Early efforts to acquire dealers were confined to tractor agencies

not having factory conversion kits available for their lines. More recently, an increasing number of independent garage operators have been seeking dealerships. Their conversions are predominantly trucks, but they also do a few tractor jobs.

Magic Gas Service, Inc., has not yet converted enough tractors to balance out the winter-summer loads, but the beneficial results on summer volume are already clearly apparent. It is only a question of time until the power fuel volume will exceed all other demands on the company.

Mr. Butterworth points out that there are many methods which promote sales volume for LP-Gas dealers. Some of them produce results at considerable cost. His carburetion activities have increased his total volume, raised his net profits on fuel by increasing his summer volume, and all this has been accomplished with a good profit on the direct sale of conversions in his own plant, plus an extra profit on the wholesale end of the equipment business. The activity has also brought extra profits to the other LP-Gas dealers in the territory for which he holds the carburetor franchise.

A. O. Smith Will Market Hughes Carburetors to Dealers

A. O. Smith Corp., Milwaukee, manufacturer of LP-Gas storage tanks, has entered the LP-Gas carburetion business. Arrangements have been completed with the Hughes Carburetor Co., of Oklahoma City, for

A. O. Smith to acquire manufacturing and sales rights for an LP-Gas carburetion adapter unit developed by L. L. Hughes.

The Hughes carburetor, around which A. O. Smith will build its selling activity, has the feature of permitting the existing gasoline fuel system to be retained on the vehicle, providing LP-Gas carburetion as an alternate fuel. This permits operators to use gasoline if difficulty should be encountered in obtaining butane or propane.

Marketing plans call for a simplified packaged merchandising program built around the sale of complete conversion kits. Thus dealers can sell pre-engineered units easily assembled and installed.

This enables the LP-Gas dealer to merchandise conversion kits as off-the-shelf, ready-to-install units.

Through its nationwide product service division, A. O. Smith will provide field service and warehouse the carburetion equipment. Initial sales efforts are being concentrated in the North Central states marketing area. It is planned to expand the sales program to other parts of the country soon.

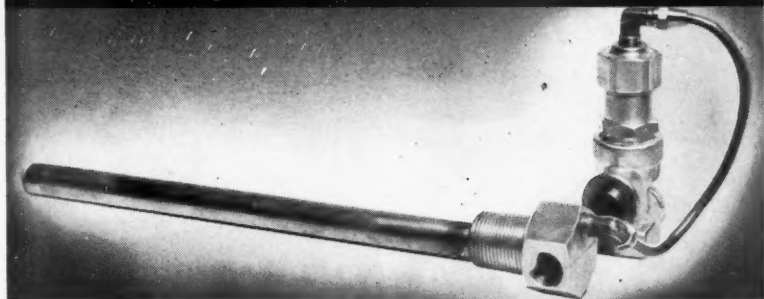
Field training schools have already been held to instruct dealers and servicemen in the installation of Hughes equipment on vehicles previously limited to gasoline fuel.

Pyrofax Gas Div. Changes Name to Pyrofax Gas Co.

Pyrofax Gas Co., a division of Union Carbide & Carbon Corp., is the new name of the Pyrofax Gas Division.

The announcement of the change in name of the New York firm comes from Walter A. Naumer, vice president of the company.

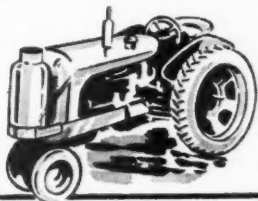
ANOTHER *Garretson* EXCLUSIVE!..



The automatic "Pressure-Controlled" IMMERSION TANK VAPORIZER!

Newest Garretson Exclusive is the Automatic "Pressure-Controlled" IMMERSION Tank Vaporizer. A special positive-working, pressure-controlled valve governs this dependable, trouble-free Immersion Tank Vaporizer AUTOMATICALLY, maintaining a constant fuel tank pressure, and assuring adequate vapor supply *under all conditions!* It provides the advantages of a liquid withdrawal system plus all the advantages of a vapor withdrawal system in one economical and compact unit.

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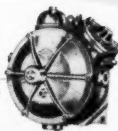
Tama Distributors, Inc.
Box 6204 Memphis, Tenn.
Suburban Gas Service
60 E. Foothill Blvd. Upland, Calif.
Town & Country Gas Company
620 S. Cliff Ave., Sioux Falls, So. Dak.



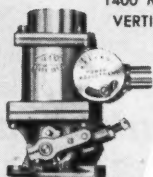
**FOR
TRACTORS
BUSES, TRUCKS
AND INTERNAL
COMBUSTION
ENGINES**



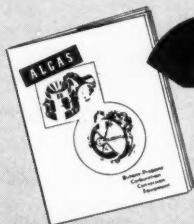
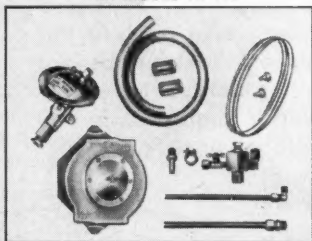
1500-E CONVERTER
WITH ELECTRIC PRIMER



1400 MIXER
VERTICAL



LIQUID WITHDRAWAL
KIT MODEL VK 115



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PROPANE**
CARBURATION CONVERSION EQUIPMENT
*IS ENGINEERED FOR EVERY
LP-GAS REQUIREMENT*

MONTH AFTER MONTH as the LP-Gas Industry continues to expand, dealers and users alike are turning in increasing numbers to ALGAS for the equipment they need. The ALGAS line includes a wide range of sizes in converters, regulators, carburetors and heat exchangers to meet the requirements of all sizes of engines. ALGAS engineers are continually developing improvements for an industry which they helped to pioneer. They stand ready at all times to provide complete assistance to you on any LP-Gas carburation conversion problem that you may have.

AMERICAN LIQUID GAS CORPORATION
1109 Santa Fe Avenue • Los Angeles 21, California

Specially Designed Burners Solve Lime Dehydration Problem

By Cliff Prodger

THE fact that LP-Gas never suffers in actual operational tests against other fuels has been emphatically demonstrated once again—this time at the processing plant of Western Lime Products Co. near Simi, Calif.

Western Lime has been given a considerable amount of attention within its own industry. Several years ago the company began processing a mountainous deposit of sea-shells for their pure lime content. The final product is marketed as a food or dietary supplement for poultry and livestock.

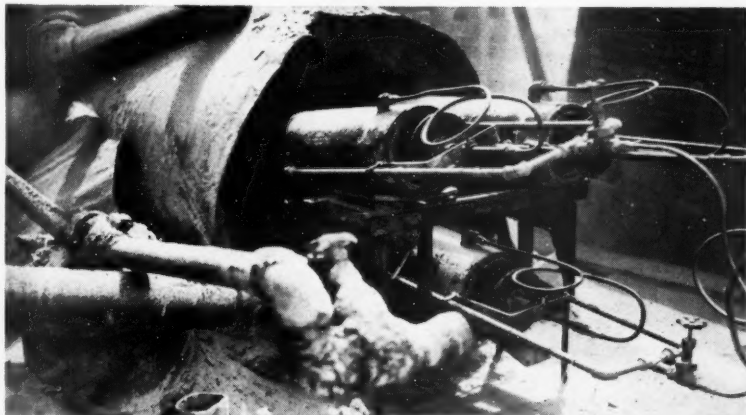
A vital part of the process is the drying of large chunks of the sea-shell in a rotating drum. Shell is re-

moved from its huge deposit and conveyed to the rear of the drying unit, where it is picked up and moved forward in the rotating drum by fixed baffles.

As it moves it is broken into smaller pieces, dried and removed through a collector grate which accepts nothing larger in size than a walnut, thus insuring complete drying of the lime. In subsequent operations the lime is reduced to as fine as 100 screen, although coarser grades are also produced.

In front of the collector vent is a

A 3-burner installation, each having an output of $5\frac{1}{2}$ million Btu per hour.



stationary drum with the interior fire bricked in order to retain maximum temperatures.

Western Lime used oil-firing in its initial operations although several drawbacks were immediately seen. First, the fuel tank was located high on the nearby mountain of sea shells in order to develop a head of oil pressure for the burners. In cold weather it was necessary to build bonfires under the pipeline in order to get the oil thin enough to fire up the dehydrator. The net results were wasted man hours and fire hazard.

Second, it was necessary to pre-heat the furnace before any material was processed under adverse weather conditions. When the sea shell held a high moisture content, oil's combustion was incomplete unless production was slowed and the furnace kept at extremely high temperatures. According to the management, consumers complained that the occasional smell of unburned oil in the lime kept livestock from touching it.

In addition, the bricks were covered with carbon, the entire unit smoked, and burners, manifolds, fuel lines and the entire area were covered with oil. Workers added their complaints to those of the consumer.

Jim Snow, manager in Simi Valley for Mutual Liquid Gas Equipment Co., Inc., Inglewood, Calif., had supplied LP-Gas to the home of Western



Plant of Western Lime Products Co. near Simi, Calif., which processes huge sea shell deposits.

Lime's superintendent of operations. He had heard of the problem the concern had with oil, studied it and made arrangements for his company to design a test installation.

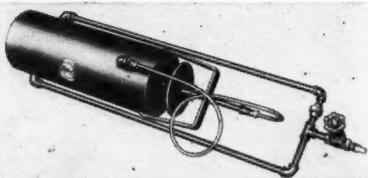
The result was development of Mutual's new and improved liquid gas, self-generating burner of high capacity. Tests were so spectacularly successful that another two-burner unit has been ordered for a new processing plant.

Western Lime's officials had specified that the first installation include three burners. The Mutual system was so efficient, however, that one burner handles the average operation, two will handle "saturated" lime, and the third has been relegated to service as an alternate unit.

Joe Fagan, president of Mutual Liquid Gas, reported that the moment the system was fired up it became apparent that it could handle the job without pre-heating the furnace. Combustion characteristics were complete and, as a matter of fact, immediately blasted the brick furnace clean and white with a huge puff of loosened oil carbon.

One burner vaporizes 60 gal. of fuel per hour with an output of roughly 5½ million Btu under 40-lb. inlet

Mutual industrial burner developed to dry sea shell deposits.



MANCHESTER TRACTOR TANKS give Custom Conversion



Operating safety and savings are the result of Manchester's field experience with all types of mobile equipment.



For the type of tractor illustrated they provide streamlined, factory-installed appearance. The driver has unimpaired vision and protection thru built-in hot air stops, and combination hood supports.

Tanks come equipped with mounting brackets requiring no drilling; installation time is reduced to an absolute minimum—no disassembly of steering column.

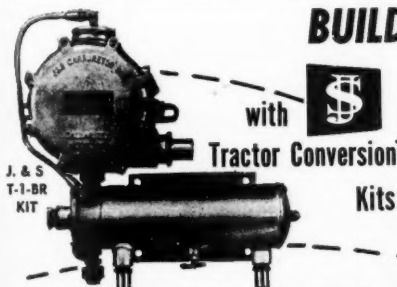
All valves are UL approved and conform to all industry standards.

Custom designed Manchester tanks with suitable mounting brackets are available for all makes and models of trucks and tractors. They are machine welded and manufactured by production line methods for uniform strength, dependable service and finished appearance.

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2880 Norton Ave., Lynwood, Cal.
Phones: NE 1-9357 NE 6-2839

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Tractor Conversion
Kits

Converting your customers' tractors to LP gas means big savings to them... greater profits to you... with big summer loads.



The J. & S. Conversion Kit is furnished either in the T-1-BR Liquid Kit (with vaporizer) or in the BR-Vapor Kit (without vaporizer). In certain cases, where the vaporizer is not required the BR Vapor Kit may be used... and later, if needed, the vaporizer can be added without further change of regulator.

USES ORIGINAL CARBURETOR

J. & S. Conversion units can be spudded in directly to original equipment carburetor on any tractor... no changes are necessary to throttle or choke controls or governor adjustment. Kits come complete with all necessary hose and fittings and can be installed in a few hours.

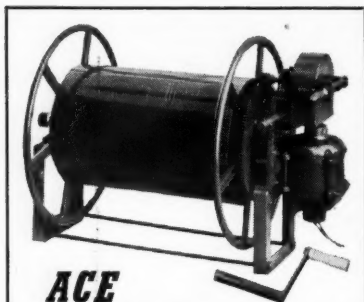
T-2-BR KIT

For trucks with engines up to 175 HP, T-2-BR Kit also available.

Write for detailed information or nearest distributor's name.

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pressure. It eliminates the necessity for additional vaporizing equipment and operates directly on liquid butane or propane at tank or single-stage regulator pressure.

Liquid gas is introduced into a jacket surrounding the combustion tube where it is vaporized by burner heat. It passes through vapor tubes to the orifice where it picks up the air necessary to combustion. The orifice is equipped with an easily adjustable disk for air regulation. The manufacturer states that these high-pressure burners and LP-Gas are adaptable to many other heavy-duty dehydrating jobs.

December-January Shipments to States

THE Committee on Liquefied Petroleum Gas, appointed to make a study of the demand for LP-Gas by states for the months of December, 1950, and January, 1951, for the National Petroleum Council, has completed its assignment. The committee is under the chairmanship of W. K. Warren, Warren Petroleum Corp.



W. K. WARREN

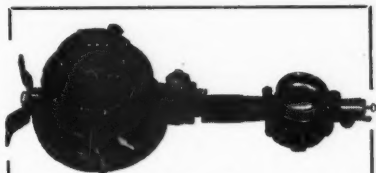
The compilation of the figures shown in Table 1 is based upon returns from questionnaires sent to fuel suppliers. The figures are particularly interesting because it is the first breakdown ever made in the industry of shipments made into individual states.

Other members of the committee are Peter A. Anderson, Joe Miller, J. W. Foley, K. W. Rugh, Brown L. Meece, and W. G. Skelly.

TABLE 1 — SUMMARY OF LIQUEFIED PETROLEUM GAS SHIPMENTS BY SUPPLIERS DURING DECEMBER, 1950, AND JANUARY, 1951, INTO STATES AS DESIGNATED, REPORTED IN GALLONS.

Destination State	1950	1951
	December	January
	(Figures in Gallons)	
Alabama	4,070,035	3,847,184
Arizona	1,609,425	2,331,336
Arkansas	6,939,428	6,497,564
California	16,170,131	19,797,576
Colorado	3,684,376	4,038,420
Connecticut	2,619,643	2,712,851
Delaware	352,401	554,818
District of Columbia	479	47
Florida	5,752,380	6,579,238
Georgia	6,649,502	7,330,854
Idaho	296,396	381,658
Illinois	15,767,118	17,253,496
Indiana	6,867,069	7,030,657
Iowa	4,640,773	5,628,321
Kansas	10,379,896	11,085,236
Kentucky	2,464,211	2,515,023
Louisiana	14,470,519	15,201,371
Maine	768,134	867,001
Maryland	2,351,594	2,460,999
Massachusetts	2,854,115	3,314,216
Michigan	7,673,183	8,034,056
Minnesota	4,609,301	5,571,959
Mississippi	4,247,463	4,032,289
Missouri	7,418,621	7,930,241
Montana	487,836	487,091
Nebraska	3,644,637	3,915,776
Nevada	619,465	757,410
New Hampshire	640,298	575,765
New Jersey	6,108,606	6,947,515
New Mexico	4,029,834	4,653,968
New York	5,054,327	5,125,487
North Carolina	5,622,428	6,062,154
North Dakota	1,470,263	1,458,448
Ohio	4,624,551	4,745,977
Oklahoma	13,051,660	14,515,253
Oregon	2,638,808	3,180,491
Pennsylvania	6,800,117	7,225,000
Rhode Island	254,333	286,205
South Carolina	4,053,296	4,586,079
South Dakota	2,508,390	2,509,019
Tennessee	2,581,811	2,516,959
Texas	51,666,883	56,270,581
Utah	126,944	59,929
Vermont	510,575	572,239
Virginia	2,790,084	2,908,130
Washington	2,157,353	2,174,589
West Virginia	1,162,021	702,733
Wisconsin	5,497,424	5,762,429
Wyoming	924,401	954,629
Canada	10,482	10,487
Mexico	59,930	38,197
Various States	776,411	999,175

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Associations



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NBPA District Meeting

The next district meeting of the National Butane-Propane Assn. will take place at the Texas hotel in Fort Worth on June 12. The morning session will be followed by luncheon and an afternoon speaking program, according to E. E. Hadlick, executive vice president of the group. President Charles Grau will preside.

NBPA members attending the meeting have been invited to attend the 3-day Southwest Butane Exposition and annual convention of the Texas Butane Dealers Assn. which gets under way on June 13 in the same hotel.

Central States, LPGA

One of the important LPGA district meetings will be held June 4-5 at the Tulsa hotel, Tulsa, when the Central States District convention and trade show will convene.

According to Robert Tanner, district secretary, speakers will include

O. L. Garretson, General Tank & Steel Corp., Roswell, N. M., and R. H. Mahnke, LPGA manager of district organizations. There will also be a presentation by a member of the National Committee for LP-Gas Promotion and a fire demonstration staged by the U. S. Bureau of Mines.

Two luncheons, a banquet, fellowship hour, and dance are included in the program.

Mountain State District

The first annual meeting of the Mountain States District of the Liquefied Petroleum Gas Assn. will be a

three-day event, June 10-12, at Troutdale-in-the-Pines, Colo., according to J. C. Crawford, secretary of the district. Sponsors are the state associations of Colorado, New Mexico, Montana, Utah, and Wyoming. It is believed that from 20 to 25 manufacturers and distributors will have displays.

Present program plans include speakers such as L. J. Wilmeth, Shamrock Oil & Gas Corp.; C. C. Owens, Surface Combustion Corp.; Lee Brand, Empire Stove Co.; M. E. Ennis, of the national promotional program; R. B. McAllister, and Rob-



J. C. CRAWFORD

ert Strawn, Jr. The latter will speak on carburetion promotion ideas.

The June dates precede the resort's seasonal opening and registration and reservations will be limited to industry members. A special program for ladies in attendance is being arranged which will include mountain trips, conducted tours, book reviews, etc.



C. D. RIBBLE



WM. J. LAWSON

Texas

Record interest in the Texas Butane Dealers Assn. Sixth Annual Convention and Southwestern Butane Exposition has brought exhibitors reservations to a total that is, at this date, 50% higher than ever before. The association has expanded its annual convention to include five states instead of Texas, alone, as in past years.

L. D. Lowry, Jr., chairman of the convention and trade show committees, reports that developments have taken shape with unprecedented speed and that the cooperation of the Fort Worth Chamber of Commerce, hotel management and association members

CALENDAR

- June 2—CNGA June Frolic. Rio Hondo Golf Club, Downey, Calif.
- June 4-5—Central States District Convention & Trade Show. Tulsa Hotel. Tulsa.
- June—West Coast LPGA District Meetings (6:30 p.m.)
- June 4, Los Angeles. Lakewood Country Club.
- June 5, San Diego. San Diego Athletic Club.
- June 6, San Bernardino. California Hotel.
- June 7, San Luis Obispo. Anderson Hotel.
- June 8, Berkeley. Hotel Claremont.
- June 10-12 — Arkansas Butane Dealers Assn. Annual Convention and Trade Show. Little Rock.
- June 10-12 — Mountain States District (LPGA) Convention and Trade Show. Evergreen, Colo.
- June 11-15—South Eastern LP-Gas Service School. Southern Technical Institute. Chamblee, Ga.
- June 12—National Butane-Propane Assn. District Meeting. Texas Hotel, Fort Worth.
- June 13-15—Texas Butane Dealers Assn. Annual Convention & Trade Show. Hotel Texas, Fort Worth.
- June 16-18—Midwest LP-Gas Service School. Iowa State College, Ames.
- June 21-22—Michigan LP-Gas Assn. Johnson's Rustic Resort, Houghton, Mich.
- June 25-27—Mid-Continent LP-Gas Service School. University of Kansas. Lawrence.
- July 8-11—Southern LP-Gas Service School. Louisiana State University, Baton Rouge.
- July 13—LPGA District 2. Western Merchandise Mart. San Francisco.
- July 16-18 — Mid-West LP-Gas Service School. Iowa State College. Ames.
- Aug. 5-6—Tennessee LP-Gas Assn. Convention. Andrew Jackson Hotel. Nashville.
- Aug. 20-21—Kentucky LP-Gas Assn. Convention and Trade Show. Seelbach Hotel. Louisville.
- Aug. 29-31—Western LP-Gas Service School. "U" of California. Berkeley.
- Sept. 10-11—Virginia Liquefied Petroleum Gas Assn. Convention. Hotel Roanoke. Roanoke.
- Sept. 10-12—Eastern LP-Gas Service School. University of Bridgeport. Bridgeport, Conn.
- Oct. 4-5—California Natural Gasoline Assn. Ambassador Hotel, Los Angeles.

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A DEPENDABLE SOURCE
UNIFORM PRODUCTS
A CAPABLE SUPPLIER
TWENTY YEARS' EXPERIENCE

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has provided the committee with valuable assistance in advance work.

Exposition and convention will be held June 13-15 inclusive. Nationwide developments in the butane industry will be given a prominent place in the spotlight. Programming is being held until the last weeks in order to encourage complete national and regional coverage.

Committee spokesmen believe that early responses indicate the largest exhibitor representation in the history of trade shows in the state. Nearly 20% more booths will be available to exhibitors than ever before.

The five-state area includes New Mexico, Colorado, Oklahoma and Louisiana in addition to Texas.

The show has been slanted directly at the Southwestern industry and its specific characteristics. Mr. Lowry points out the fact that the convention and exposition will be the first time dealers of that huge territory have been brought together for such an event.

CNGA

The annual June Frolic of the California Natural Gasoline Assn. will be held June 2 at the Rio Hondo Golf Club, Downey, Calif., for gas and natural gasoline industry men, according to Charlie Rajnus, entertainment chairman.

The day's activities of golf tournaments and softball, and less strenuous activities, will be climaxed by a barbecue and an evening of entertainment.

IN ORDER TO INCORPORATE IN this issue as many references as possible to Farm, Industrial and Tractor applications, reports on many state association meetings will not be published until July.

Look for them next month under the usual heading of "Associations."—Editor.

LPGA Shows to Its Largest Crowd

By Paul Lady

LPGA's biggest convention was held in Chicago May 7-10. The fast-moving, four-day meeting attracted more than 2200 industry members. One hundred exhibitors presented the latest in appliances and equipment to LP-Gasmen from every section of the country and many foreign lands.

William S. Lander became the new president of LPGA, succeeding Peter A. Anderson. As head of Rulane Gas Co., Charlotte, N. C., Mr. Lander is well-qualified to handle the destinies of the organization for the coming year.

Other newly elected officers include: F. N. Mabee, Denver, first vice president; C. M. Ambrose, Seattle, second vice president; Walter Miller, Chicago, treasurer. Howard D. White and Arthur C. Kreutzer were reelected executive vice president and vice president and counsel, respectively.

A highlight of the meeting was the presentation of the distinguished

service award of the Liquefied Petroleum Gas Assn. to George G. Oberfell. Mr. Oberfell is a retired vice president of Phillips Petroleum Co. and at the present time is serving as a consultant for the RFC in Washington.

The award was made to Mr. Oberfell because of his many research and scientific contributions to the advancement of the liquefied petroleum gas industry. He was a pioneer in the industry and has been known nationally as an authority on petroleum research for many years. Under his direction much of the progress in new developments for the use of LP-Gas were brought about and put into practical use.

The citation was presented to Mr. Oberfell by Mark Anton, president of Suburban Propane Gas Co., Whip-

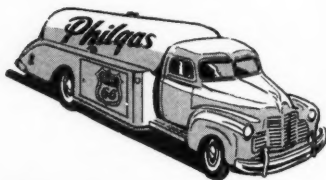
New LPGA president W. S. Lander receiving congratulations of retiring president Peter Anderson, with Foster Mabee, new first vice president, looking on.



G. G. Oberfell receiving distinguished service award from Mark Anton with retiring president Peter A. Anderson in background. Taken at LPGA Convention.



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pany, N. J., who was the first industry member to receive the award. The second recipient was A. N. Kerr, Imperial Gas Co., Los Angeles.

Meetings interspersed throughout the program presented topics of interest to the industry today. Among them were talks by James E. Pew who discussed the effect of defense orders upon the LP-Gas industry and the nation-wide need for increased fuel storage capacity; Howard D. White's review of government controls and the Washington scene; the national advertising and promotion program by Lee Brand; and the farewell address of Peter A. Anderson, retiring president.

Digests of some of the papers delivered and lists of new district and state directors will appear in these columns next month.

LPGA Board Meeting

The quarterly meeting of the board of directors of the Liquefied Petroleum Gas Assn. was held in Chicago in conjunction with the annual association convention.

Among the reports from the various committee chairmen, the one by W. A. Schuette, membership committee, showed that the total membership of the organization is now over 1400.

The board adopted a resolution to be sent to Bruce Brown, Petroleum Administrator, to emphasize the important part played by LP-Gas in the furtherance of national health and safety.

A second resolution was passed by the board requesting that the National Committee for LP-Gas Promotion give consideration in its educational program to the promotion of LP-Gas for tractor fuel use.

The board fixed the schedule for its quarterly meetings for the com-

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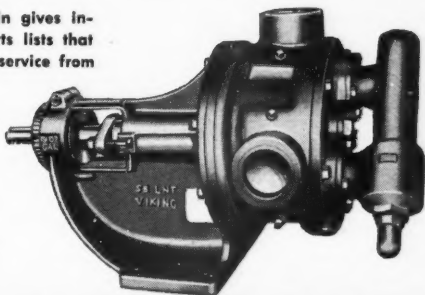
The Viking heavy-duty pump bulletin gives instructions, operational data and parts lists that will help you get better and longer service from your Viking pumps.

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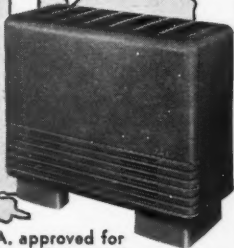
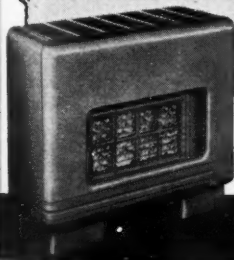
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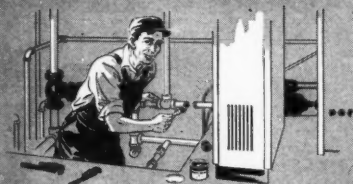
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ing year as follows: September, Denver; December, St. Louis; February, Mexico City; May, Chicago.

The 1952 annual LPGA convention will be held in Chicago May 12-15 at the Palmer House. The 1953 convention will again be held at the Stevens, tentatively set for May 4.

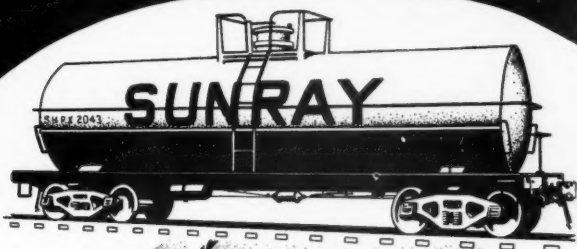
Further attention was given to the problem of adequate storage of LP-Gas throughout the nation. The special committee appointed at the March directors meeting, headed by Louis Abramson, requested that the industry at all levels carry on this work until such time as adequate storage may exist to fulfill the obligation of the industry to maintain an even and plentiful supply of product to all consumers. Chairman Abramson reported that his committee is carrying on studies to develop specific formulas in an attempt to solve the problem of unbalanced load.

The technical and standards committee, headed by Bob Poethig, the Bastian-Blessing Co., reported that one result of the committee's work is the adoption by the ICC of regulations which will allow for private motor carrier shipments of ASME and API-ASME pressure vessels intended for permanent installation when partially charged with LP-Gas. This provision may now be followed subject to the conditions in the section of ICC regulations pertaining to freight tariffs.

A large number of recommended changes and amendments to Pamphlet 58 were proposed. Among them are those including changes in Section 4 covering the use of fuel for internal combustion engines. This was due to the increased use of LP-Gas for engine fuel. This recommendation has been accepted in substance by the committee on gases of the NFPA for inclusion in Pamphlet 58.

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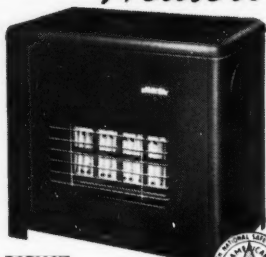
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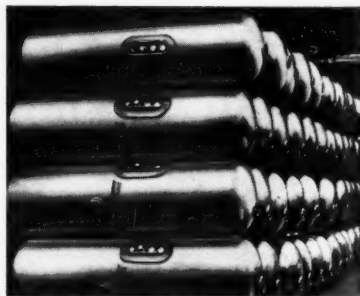
The Trade

Safety Features Built Into Tanks for Chicago Buses

American Pipe & Steel Corp., Alhambra, Calif., recently completed the manufacture of 50 LP-Gas tanks to be used on the buses of the Chicago Transit Authority.

This contract is the latest of a series of similar jobs handled by American Pipe & Steel. Previous ones have included a number of conversions of buses from gasoline to LP-Gas. The present activity, however, is for a fleet of new buses which have been factory designed by Twin Coach Co. to use liquefied petroleum gas as fuel.

The tanks, which the Chicago organization asked the West Coast firm to design and produce, involved two unique safety features: 1. Each unit is actually a tank within a tank, al-



Fifty fuel tanks manufactured by American Pipe & Steel Corp. for propane passenger buses now operating in Chicago.

BUTANE-PROPANE News



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A. R. Wood "Radiant" Gas Brooders radiate infra-red heat uniformly, warming chicks all the way through. Thermostatically controlled multi-burners use less gas more efficiently and safety flash tubes light all burners from one pilot should other pilots go out — these are just a few of the features that have made the A. R. Wood "Radiant" Gas Brooders first in the field.

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lowing for expansion of the fuel without any danger, and manufactured by American under Parkhill-Wade patents. 2. Controls are recessed for maximum safety. The special controls are inset in a well within the tank to prevent knocking them loose or out of position.

Electric Refrigerators Marketed by Servel

The first electrically-operated Servel refrigerators to be marketed in this country were shipped in May, according to a recent announcement from W. Paul Jones, Servel, Inc., president. These electric units were formerly manufactured for export purposes exclusively.

Promotion of gas refrigerators will not be lessened by this move, according to Mr. Jones, but the introduction of the electric absorption refrigerator in the United States will help increase total volume of production.

John Kelderhouse has joined the Crown Stove Works, Chicago, as direct factory representative for southern Illinois. He is well known by LP-Gas dealers and operators in that territory because he has called on them in the past with gas space heaters.

Previous to the time spent selling heaters, he had been with a prominent gas utility as a retail salesman. He, therefore, comes to Crown with experience in both wholesale and retail merchandising.

Robert L. Kidd, vice president and manager of the Land & Geological Div., Cities Service Oil Co., Bartlesville, Okla., has been appointed assistant to the president, according to

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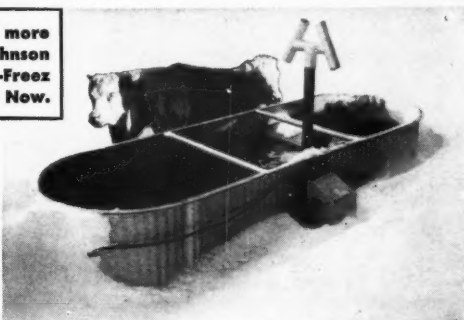
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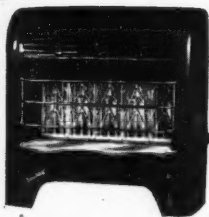
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an announcement from President A. W. Ambrose.

Mr. Kidd, who is also a director of the company, will continue to work on oil exploration and development. He has been with the company more than 25 years.

Announced recently by Lyle C. Harvey, president of **Affiliated Gas Equipment, Inc.**, Cleveland, is the election of J. A. Hughes as vice president of AGE and his subsequent appointment as general manager of the **Bryant Heater Div.**,



J. A. HUGHES

which operates plants in Cleveland, Indianapolis, and Tyler, Texas.

Mr. Crawford has also announced the appointment of Frank L. Early to manage Bryant's Dallas branch. He formerly was associated with the Laclede Gas Light Co. and Servel, Inc.

In order to better serve its customers in the southeastern area, **Beacon Petroleum Co.**, Tulsa, has appointed I. J. Jones as Southeastern representative with headquarters in Atlanta. He comes to this position after 20 years with **Phillips Petroleum Co.**, including association with its Atlanta LP-Gas division.

Beacon also maintains offices in Houston, with H. R. McFarland, vice president, in charge, and in Chicago with Edward McLean as manager.

Of the 779 employees in the Chicago plant of **The Bastian-Blessing Co.**, eight have been with the company over 40 years, 62 have had over a



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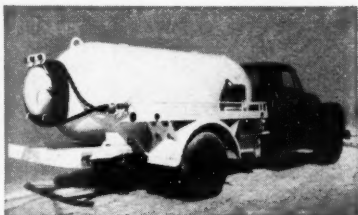
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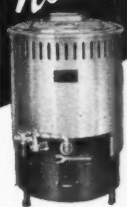
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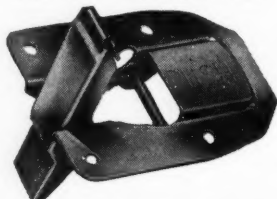
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**Completely flush installation,
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quarter of a century of service, and 109 have been with it over 10 years. This service record represents a total of over 2960 man-years of experience and skill for this group alone.

Burrell Corp., manufacturers of scientific apparatus and laboratory chemicals, has moved to new offices and laboratories at 2223 5th Ave., Pittsburgh, Pa., according to Executive Vice President Guy H. Burrell.

The new headquarters is a 5-story, steel and concrete structure with warehouse areas, well-equipped laboratories, workrooms and air-conditioned offices. It is equipped with conveyors for the delivery of parts and materials from one department to another. In addition to the above features, the building enables the company to allot space for a customer display room.

The appointment of Arthur E. Wastie as vice president and chief engineer of H. Emerson Thomas & Associates has been announced recently by H. Emerson Thomas. Mr. Wastie had been manager of the eastern office of Phillips Petroleum Co., serving utility and industrial plants, and had served in a similar capacity with Pacific Gas Corp.

Mr. Wastie's appointment followed the resignation of Paul E. Peacock, Jr., who had served the Westfield, N. J., firm in the above named positions and who now is engaged individually in LP-Gas engineering.

James V. Loughlin, 65, manager of the New York office of Downingtown Iron Works, Inc., died on Feb. 22 at his home in Dover, N. J.

Mr. Loughlin had served in the above position since 1922.

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LPGA Changes Schedule For California Meetings

The contemplated June 1 meeting in Los Angeles of District 2 of the LPGA has been cancelled and instead this one-day meeting has been expanded to five evening meetings to be held in various sections of California, all beginning at 6:30 p.m.

It is thought by Ben Marsh, West Coast secretary, that the new arrangements will permit a larger number of dealers to attend and at more convenient times. The new schedule of meetings and chairmen follow:

June 4, Los Angeles, Lakewood Country Club. Harry I. Horn. June 5, San Diego Athletic Club. Rudy Munser. June 6, San Bernardino, California hotel. W. R. Sidenfaden. June 7, San Luis Obispo, Anderson Hotel. John Klor. June 8, Berkeley, Hotel Claremont. Don McNary.

Howard D. White, executive vice president of the LPGA, and now representing the association in Washington, D.C., will appear at all of these meetings to interpret for dealers the government controls.



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American Stove Co.	—
★ American Petroleum Co.	Third Cover
Anco Manufacturing & Supply Co.	3
Armstrong Products Corp.	184
Bagwell-General Steel Co., Inc.	185
★ Bastian-Blessing Co., The.	96, 97
★ Beacon Petroleum Co.	42
★ Black, Sivals & Bryson, Inc.	18, 19, 31
Bowser, Inc., Incinerator Div.	185
Bright Leaf Industries, Inc.	181
Brower Manufacturing Co.	—
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Bryant Heater Division.	93
★ Buehler Tank & Welding Works.	—
Burnham Corp.	—
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Calor Gas Co.	168
★ Caloric Stove Corp.	—
Carey Copper & Brass Co.	185
Carter Oil Co., The.	181
★ Century Gas Equipment Co.	155
Cities Service Oil Co.	172
★ Coleman Co.	—
★ Columbian Steel Tank Co.	—
Commercial Shearing & Stamping Co.	—
★ Corosaire Heater Corp.	27
Crane Packing Co.	178
Cribben & Sexton Co.	—
Dallas Tank Co.	—
Darlingas, Inc.	163
Dearborn Stove Co.	—
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Dickerson Manufacturing Co.	—
Dix Manufacturing Co.	169
★ Downingtown Iron Works, Inc.	—
Ellis Manifold Co.	—
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★ Ensign Carburetor Co.	160
★ Estate Stove Co.	—
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Florence Stove Co.	—

(Continued on Page 192)

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Advertisers—Continued

Gas Appliance Manufacturers Assn.	—	Pacific International Products, Inc.	13
* Gas Equipment Co., Inc.	184	Pan-American Casualty Co.	—
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General Controls.	187	* Peerless Manufacturing Corp.	177
General Gas Light Co.	131	Phillips & Buttorff Mfg. Co.	—
* Glo-Fire, Inc.	149	* Phillips Petroleum Co.	176
Griffiths Co., The E. F.	186	Pittsburgh Equitable Meter Division ..	1
		* Pressed Steel Tank Co.	21
		.....Second Cover, 20, 21	
Hamilton Manufacturing Co.	—	Queen Stove Works, Inc.	29
Handbook Butane-Propane Gases.	173	* Radiator Specialty Co.	—
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Holsclaw Bros., Inc.	187	* Robertshaw-Fulton Controls Co.	28
		* Rockwell Manufacturing Co.	147
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* Ingersoll Rand Co.	—	Roper Corp., George D.	133
International Metal Hose Co.	183	* Ruud Manufacturing Co.	15
		Santa Fe Engineering Equipment	
J & S Carburetor Co.	167	Co.	157
* Johnson Gas Appliance Co.	183	* Scaife Co.	Front Cover
		* Security Manufacturing Co.	187
* Kerotest Manufacturing Co.	111	Selwyn-Landers Co.	4, 5
		Servel, Inc.	22
* Linde Air Products Co., The Unit		* Shell Oil Co.	119
of Union Carbide & Carbon Corp.	7	Siebring Mfg. Co.	188
* Liquefied Petroleum Gas Assn.	—	Sinclair Oil & Gas Co.	103
Locke Stove Co.	—	* Smith Corp., A. O. (Gas Tanks)	35
LPG Carburetion, Inc.	169	* Smith Corp., A. O. (Water Heaters) ..	—
LPG Credit Corp.	—	* Smith Precision Products Co.	141
LPG Insurance Underwriters.	—	* Sprague Meter Co.	116
Lubbock Machine Co., Inc.	6	Squibb-Taylor, Inc.	—
		* Stampings, Inc.	14
Madden Brass Products Co.	—	Stanolind Oil & Gas Co.	40
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Manchester Welding & Fabricating		Sunray Oil Corp.	179
Co.	167	Superior Tank & Construction Co.	26
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Minneapolis-Honeywell Regulator Co.	95	Tennessee Stove Works.	127
Minneapolis-Moline Co.	—	Thomas Truck & Caster Co.	—
Motor Wheel Corp.	125	* Titan Valve & Mfg. Co.	129
Mutual Liquid Gas Equipment		* Trageser Copper Works.	
Co., Inc.	122	Inc.	Fourth Cover
		Trinity Steel Co., Inc.	107
National Committee for LP-Gas		* Union Carbide & Carbon Corp., The	
Promotion, The.	—	Linde Air Products Co. Unit.	7
National L-P Gas Institute.	—	* United Petroleum Gas Co.	9
* Neptune Meter Co.	137	* United States Rubber Co.	33
* Nordstrom Valve Division.	147		
Norris Thermador Corp.	24, 25	* Viking Pump Co.	177
* North Texas Tank Co.	10	* Vulcan Rubber Products, Inc.	34
* Ohio Foundry & Manufacturing Co.	30	* Warren Petroleum Corp.	36
* O'Keefe & Merritt Co.	109	* Weatherhead Co., The.	100, 101
		Weldit, Inc.	174
		Well Equipment Mfg. Corp.	—
		William Wallace Co.	11
		* Wood, A. R. Mfg. Co.	182

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